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National Potato Breeding Report, 1980

Fifty-first Annual Report by Cooperators

Compiled and Edited
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UNITED STATES DEPARTMENT OF AGRICULTURE
BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC), BELTSVILLE, MARYLAND
AND CHAPMAN AND AROOSTOOK FARMS, PRESQUE ISLE, MAINE

Raymon E. Webb, Philip Baum, George W. L. Walter, and Robert W. Goth, BARC
and
David R. Wilson, Presque Isle, Maine

BARC

Breeding and Evaluation: Sixty-seven clones and varieties possessing a diversity of economic characters were included in the breeding block. Four hundred sixty-two parental combinations were obtained, yielding approximately 470,000 true seed. One hundred twenty-nine seed lines were planted for seedling tuber production, and about 64,000 tubers were harvested for distribution in 1981. Approximately 400 clones were evaluated for resistance to viruses A, X, and Y.

PRESQUE ISLE

Planting began May 12 and was completed May 30. Quite dry soil conditions prevailed during planting and again for about 5 weeks during July and early August. Harvest was again plagued with excessive rainfall.

CHAPMAN FARM

Approximately 3,200 seedling tubers from 12 parental combinations were planted for selection purposes. Seven hundred 12-hill lots were grown for further selection and quality evaluations. Sixty, eighty, and one-hundred-hill lots were grown for pest resistance and adaptability evaluations and further quality assessments. A number of clones, including B6969-2, B6987-184, B7583-6, B7805-1, B8833-6, B8934-4, B8943-4, and B8972-1, were on maximum seed increase and are in grower trials.

AROOSTOOK FARM

Varietal collections and older breeding lines were grown for maintenance and distribution to cooperators. Yield and disease-resistance trials were done on Aroostook Farm and nearby Silver's Farm. Experimental design for all yield trials was a randomized block with four replications of 25 seed pieces each. White tuber trials received 150 pounds NPK per acre, and russet types received 180 pounds NPK per acre banded with a two-row planter. Seed spacing for white tuber trials was 9 inches and for russet trials 12 inches. All plantings were done by hand.

Cultural methods and materials for weed, insect, and disease control were according to local recommendations. Rainfall and temperature during the season are given in Table 4. At harvest, all entries were graded and samples hand selected for specific gravity and quality evaluations. Specific gravity

was determined by the air-water method. Following specific gravity determinations, selected samples were divided and placed at 50° F, 45° F, and 40° F storage at 90 percent relative humidity.

Samples stored at 50° F and 45° F were processed into chips after 2 months in storage. Samples stored at 40° F were divided into two groups: one group to be reconditioned at 70° F for 3 weeks prior to frying; and one group to be fried direct from 40° F after 4 months' storage if processing data from the 50° F stored group indicated potential low reducing sugar content buildup at that temperature. Russet samples were also processed into french fries.

Potato chips were made from each sample by cutting the russet tubers in half and taking a 1/16-inch-thick slice from each tuber with a rotary food slicer. Slices were rinsed in water and placed on paper towels to remove excess water. Chips were then fried at 340° F in Primex vegetable shortening until bubbling ceased.

A french fry plug, 3/8 inch in diameter, was cut from each half of the tubers in the sample. After plugs were trimmed, rinsed, and excess water removed, they were fried at 365° F in Primex shortening for 5 minutes.

Each potato chip and french fry was classified after frying into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French classes ranged from 1 = very light to 5 = very dark. Weighted averages were calculated by multiplying the number of chips or fries in each color class by the color class, totaled, and divided by the number of chips or french fries in each sample. Color ratings were made by using the PCII reference color chart 1206-U.

After color classification, each french fry plug was broken open and internal texture classification as 1 = mealy, 2 = intermediate, or 3 = soggy, and a weighted texture index calculated.

SUMMARY

Quite dry soil conditions during and immediately following planting delayed emergence. A long drought period extending into August reduced yields up to about 20 percent on early and midseason entries (Tables 5-7). Specific gravity and processing quality were not significantly impaired by excessive moisture throughout the harvest period. Late season rainfall did contribute to much growth cracking of tubers in susceptible clones similar to that which occurred in 1979.

Clone B7583-6 was named the variety Russette (Ru-set). Lack of disease-free seed has temporarily delayed release of B6969-2 as Oceania. B6987-184, a high solids, golden nematode resistant clone with excellent chipping quality, is in the process of being released as the variety Chipbelle. One round white and four russet clones are in grower trials in several States.

Table 1. Distribution of first-year seedling tubers and true seed from BARC, 1980.

Location	Cooperator	Number Progeny	Number Seedling Tubers	Number True Seed
Domestic:				
Arizona	J. Bidja-Mankono	1	362	500
	A. C. Schwerger	1	-	2,500
Colorado	J. A. Twomey	42	4,110	-
Maine	D. R. Wilson	15	3,294	800
Minnesota	F. I. Lauer	58	10,089	-
Missouri	Tom Wagner	18	1,518	-
Nebraska	R. B. O'Keefe	21	5,326	-
North Carolina	F. L. Haynes, Jr.	28	5,062	-
Pennsylvania	D. R. MacKenzie	18	5,226	-
	Total		34,987	3,800
Foreign:				
Australia	G. D. McLean	1	-	300
Bolivia	R. W. Hoopes	2	-	1,000
	Total	-	-	1,300
	Grand total	-	34,987	5,100

Table 2. Distribution of varieties and clones to U.S. cooperators.

State	Cooperator	Varieties	Clones
Alaska	C. H. Dearborn	-	2
Arizona	J. B. Mankono	2	-
California	A. G. Fradkin	2	-
	D. Kenfield	3	-
Colorado	K. W. Knutson	-	4
Florida	J. R. Shumaker	13	222
Georgia	C. A. Jaworski	119	24
Idaho	D. L. Corsini	2	-
Illinois	S. C. Trees	4	-
Kansas	C. W. Marr	1	-
Kentucky	C. R. Roberts	2	3
Maryland	J. Houston	1	1
	L. L. Sanford	-	76
Minnesota	F. Lobitz	43	-
New Jersey	M. Henninger	8	480
New York	E. Jones	-	3
	J. Sieczka	-	181
North Carolina	F. L. Haynes, Jr.	-	14
Ohio	F. Lower	-	1
Oregon	R. Peterson	4	1
Pennsylvania	B. Pell	3	-
	P. Grun	3	-
	D. R. Mackenzie	33	-
Texas	R. M. Taylor	-	1
	E. Fowlkes	7	-
Utah	G. D. Griffin	4	16
Virginia	B. Graves	8	287
	Total	229	1,349

Table 3. Distribution of varieties and clones to foreign cooperators.

Country	Cooperator	Number	
		Varieties	Clones
Bulgaria	K. Kostov	1	-
	H. Stoilov	5	-
Canada	N. S. Wright	-	3
Iceland	E. Siggeirsson	2	4
India	C. L. Khushu	3	-
Japan	S. Nishibe	4	-
Netherlands	H. Dingsta	1	-
	I. Wolf	2	-
New Guinea	K. Newton	2	-
Peru	H. A. Mendoza	3	-
USSR	V. S. Lekhnovitch	26	-
	H. Korsakov	5	-
Zimbabwe	M. J. Joyce	5	-
	Total	59	7

Table 4. Weekly average maximum and minimum temperature and weekly rainfall, Aroostook Farm, Presque Isle, Maine.

Week Ending	Avg. Temperature F Min.	Max.	Rainfall Inches
May 10	54	35	.94
17	67	41	.43
24	71	35	.11
31	64	38	.03
June 7	69	45	.15
14	69	42	.21
21	73	47	.87
28	80	54	2.22
July 5	74	50	.99
12	70	49	1.48
19	77	56	.33
26	80	58	1.76
Aug. 2	79	59	.81
9	81	62	1.53
16	73	52	1.06
23	77	49	.00
30	79	52	.25
Sept. 6	73	56	.73
13	65	40	.24
20	62	38	1.22
27	59	40	1.61
Oct. 4	55	39	1.14
11	50	36	.41
18	50	33	.89
	Total		19.41

Table 5. Yield, tuber size, distribution, and quality characteristics of golden nematode resistant clones harvested 120 days after planting on Aroostook Farm, 1980.

Pedigree	Mkt Cwt	% Mkt	% Tuber Size Distribution <1-7/8"	1-7/8"- 2-1/4"	2-1/4"- 3-1/4"	3-1/4"- 4"	>4"	Tuber Rating[1]	Sp. Gv.[2]	50°F 2 mos. Color[3] Chip	FF	Tex[4]	45°F direct 4 mos. Color[3] Chip	FF	Tex[4]	40°F - 70°F 3 weeks Color[3] Chip	FF	Tex[4]
B6986-2	353	87	4	16	62	22	7	2	80	6.3	1.8	1.9	6.0	2.0	2.0	6.8	2.3	1.9
B6987-184	346	86	12	42	55	3	1	2	100	7.1	2.4	1.8	7.4	2.5	1.6	6.1	1.0	1.7
B7151-4	367	91	6	27	69	4	3	2	100	7.2	2.1	1.8	5.9	1.9	1.8	6.4	1.7	1.9
B7154-10	308	81	15	44	47	9	3	2-	62	6.8	2.2	2.4	7.5	3.1	2.2	7.8	3.1	2.3
B7200-33	412	85	15	57	39	3	-	3	56	8.3	3.7	2.6	8.9	4.1	2.7	9.0	4.1	2.8
B7592-1	417	90	4	29	63	8	5	3	85	7.2	3.0	2.0	7.9	3.3	2.0	8.4	4.1	2.4
B7805-1	428	93	4	20	68	12	3	2+	74	8.7	3.8	2.3	8.0	3.6	2.3	8.3	3.7	2.7
B8491-1	314	86	6	16	64	20	8	2	85	6.5	2.4	2.0	7.3	3.0	2.0	8.4	3.9	1.9
B8514-8	449	93	6	26	65	9	1	2	85	7.4	3.2	2.1	7.5	2.9	2.0	8.4	3.7	2.0
B8710-1	430	93	7	37	59	4	-	3+	65	8.1	2.9	2.1	8.4	3.0	2.4	8.7	4.1	2.2
B8710-16	374	93	5	19	62	19	2	3+	73	7.7	3.1	2.2	8.5	3.7	2.0	8.0	3.8	2.1
B8751-6	339	91	9	33	60	7	-	2	70	7.6	2.5	2.0	7.5	2.6	2.0	7.4	3.4	1.9
Atlantic	382	91	6	25	61	14	3	3	90	7.4	2.2	1.9	7.0	2.6	1.9	6.6	2.5	2.0
Belchip	417	92	6	14	65	21	2	2	90	6.1	1.6	1.9	6.5	2.2	1.9	6.4	2.3	2.1
Wauseon	379	91	7	19	61	20	2	3	73	8.6	3.4	2.0	9.3	4.0	2.1	9.2	4.7	2.7
Hudson	372	79	3	12	51	36	18	2	75	8.8	4.0	2.2	9.0	4.5	2.0	8.2	3.8	2.2
LSD 5%	51								3.0									

[1] 1 = poor; 5 = outstanding.
[2] 1.0 omitted.
[3] Chips: 1-7 = satisfactory; FF: 1-3 = satisfactory.
[4] FF & texture: 1-2 = satisfactory.

Table 6. Yield, tuber size, distribution, and quality characteristics of clones harvested 120 days after planting (late maturity) on Aroostook Farm, 1980.

Pedigree	Mkt Cwt	% Mkt	% Tuber Size Distribution <1-7/8"	1-7/8"- 2-1/4"	2-1/4"- 3-1/4"	3-1/4"- 4"	>4"	Tuber Rating[1]	Sp. Gv.[2]	50°F 2 mos. Color[3] Chip	FF	Tex[4]	45°F direct 4 mos. Color[3] Chip	FF	Tex[4]	40°F - 70°F 3 weeks Color[3] Chip	FF	Tex[4]
B6969-2	284	89	11	37	58	5	-	3	63	8.0	3.0	2.2	8.1	3.1	2.2	7.6	2.3	2.5
B6987-184	324	90	10	35	60	5	-	2	96	6.8	2.3	1.8	7.2	2.3	1.9	6.4	1.3	1.6
B8091-8	437	90	9	37	53	10	2	2	82	8.3	3.3	2.0	8.0	3.6	2.0	7.4	3.1	2.0
B8285-3	231	82	14	47	38	15	3	2+	83	8.9	4.2	2.0	8.8	3.8	2.0	8.5	4.2	2.1
B8599-42	382	91	3	9	58	33	6	3	67	6.3	2.2	2.0	7.2	2.8	2.0	7.3	2.3	2.0
B8615-2	386	92	6	18	64	18	3	3	97	6.8	2.5	2.0	7.4	2.4	2.0	8.3	2.7	2.0
B8724-2	370	86	14	49	50	1	-	2	75	8.0	2.9	2.1	7.6	3.3	2.0	6.9	2.3	2.0
B8799-13	273	92	8	43	53	3	-	3+	85	6.2	2.4	1.8	6.2	2.3	1.7	6.4	1.3	1.7
B8907-4	320	87	5	16	54	29	8	2-	74	7.7	2.6	1.9	7.8	2.7	2.0	7.6	2.0	2.0
B9062-9	404	94	4	16	62	22	2	2	72	7.0	3.0	2.0	7.9	2.6	2.0	6.6	1.9	2.0
B9067-6	396	91	9	33	59	7	-	3	80	8.9	3.7	2.0	9.0	3.8	2.0	8.5	3.6	2.0
B9071-1	334	89	9	34	55	11	2	2	87	6.6	2.6	2.2	6.1	2.3	2.5	7.3	2.7	2.1
Atlantic	396	93	5	21	63	16	2	2+	88	7.2	2.8	1.9	6.8	2.4	1.8	6.6	1.4	1.7
Belchip	405	92	5	17	63	20	3	2	88	6.4	1.8	1.8	6.2	2.3	2.0	6.3	1.1	2.0
Pungo	371	92	4	23	63	14	4	2	80	8.6	4.0	2.0	8.9	3.5	2.1	7.1	2.9	2.0
Sebago	346	90	9	23	67	11	1	3	78	7.6	2.7	2.0	8.2	3.6	2.2	8.0	3.6	2.1
Superior	364	94	5	23	62	14	2	3	73	7.6	2.8	2.0	7.5	3.3	2.2	7.3	2.9	2.0
Katahdin	366	90	7	23	63	15	3	3+	74	8.1	3.3	2.0	8.5	3.9	2.0	8.3	3.3	2.0
LSD 5%	38								4									

1 2 3 4 - See footnotes Table 5.

Table 7. Yield, tuber size, distribution, and quality characteristics of russet clones harvested 120 days after planting (late maturity) on Aroostook Farm, 1980.

Pedigree	Mkt Cwt	% Mkt	% Tuber Size Distribution <1-7/8"	1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	>4"	Tuber Rating[1]	Sp. Gv.[2]	50°F 2 mos. Color[3] Chip	FF	Tex[4]	45°F direct 4 mos. Color[3] Chip	FF	Tex[4]	40°F - 70°F 3 weeks Color[3] Chip	FF	Tex[4]
B7583-6	279	73	5	13	52	35	23	2+	86	8.6	3.4	2.0	8.7	3.2	2.0	8.2	3.2	2.0
B8214-4	291	87	9	31	57	13	4	2	71	7.9	3.6	2.0	9.1	3.5	2.0	8.7	3.7	2.0
B8686-8	257	84	11	25	60	14	4	2	90	6.2	2.3	1.8	6.0	2.0	1.8	6.6	2.2	1.9
B8822-30	238	88	11	29	60	10	1	2+	65	7.8	2.7	2.0	8.2	2.8	2.0	7.7	2.9	2.0
B8833-6	231	81	19	44	48	8	-	3	77	7.8	2.4	2.0	7.5	2.5	2.0	8.0	2.9	2.0
B8847-5	242	81	23	15	57	28	7	3	73	8.5	3.5	2.0	9.3	4.1	2.0	8.9	4.3	2.0
B8848-2	388	82	5	13	61	26	14	2+	77	9.1	3.7	2.1	9.9	4.6	2.0	9.2	4.7	2.0
B8881-5	310	80	10	30	58	13	7	2+	64	6.7	2.0	2.1	7.5	2.4	2.0	7.6	2.1	2.0
B8902-3	224	77	8	15	63	23	15	2+	59	7.8	3.1	2.0	8.0	3.1	2.1	8.9	3.6	2.4
B8922-10	381	87	11	33	55	12	2	2+	71	8.9	3.7	2.0	9.7	3.9	2.0	8.6	4.2	2.3
B8934-4	250	82	9	20	65	15	9	2	82	6.6	2.1	2.0	6.1	2.2	1.9	6.4	2.0	1.9
B8939-8	256	83	14	31	57	11	3	2	77	9.7	4.8	2.0	9.5	4.1	2.0	8.6	4.5	2.0
B8943-4	276	78	13	29	56	16	9	2+	72	7.8	3.1	2.0	9.3	3.8	2.0	7.8	3.4	2.1
B8963-1	303	88	7	27	60	13	6	2	70	7.5	2.4	2.1	7.0	2.3	2.2	7.1	2.5	2.0
B8966-3	266	80	10	20	55	26	10	2	65	7.4	2.8	2.0	8.0	3.1	2.0	7.6	2.7	2.0
B8972-1(mixed)	216	81	17	34	52	14	2	3	75	6.7	2.2	1.7	6.6	2.2	1.9	7.5	2.8	2.0
BelRus	281	85	13	26	56	18	2	3+	76	6.4	2.7	2.0	7.8	3.0	2.0	7.9	3.2	2.3
Rus. Burbank	382	79	13	33	54	15	4	2	86	8.3	3.0	2.6	8.1	3.2	2.0	7.5	2.8	2.2
LSD 5%	55								4									

[1] [2] [3] [4] - See footnotes Table 5.

INTERREGIONAL POTATO INTRODUCTION PROJECT (IR-1)

R. W. Ross and R. E. Hanneman, Jr.

Introduction of New Stocks. Forty-six new stocks were received from four countries. Seventeen were clonal selections of cultivated types, requested from the Netherlands and Scotland. The remainder were true seeds of Argentine and Peruvian non-cultivated species donated by the collectors.

Preservation and Increase of Stocks. Approximately 90 percent of the introductions contained in the collection are maintained as true seed. Satisfactory seed increase of 135 species introductions and intraspecific hybrids were obtained under glass, fiberglass or screen. Recently-harvested seed samples of 111 species introductions were packaged for storage in the National Seed Storage Laboratory. Germination percentages of 814 seed lots of 2-20 years of age were determined.

Sixteen introductions have been placed in meristem culture, 12 of which were heat treated. One hundred and twenty-four species clones were tested serologically for potato viruses X (PVX) and S (PVS) using the latex agglutination technique. Seven meristem derived plantlets have been found to be PVS and PVX free. Seventy-five species introductions, 226 foreign varieties, 20 interspecific and research stocks were tested for potato spindle tuber viroid (PSTV) using polyacrylamide gel electrophoresis. Fifty-three (16.5 percent) were found to be infected and were discarded. Three late blight differentials are now freed of virus through meristem culture procedures and will soon be available for distribution.

Classification. More than 4,000 herbarium mounts representing specific and interspecific variability of 99 species are now available for taxonomic use.

Eighteeen F_1 and 15 F_2 interspecific crosses between Bolivian wild species were made for Solanum taxonomist, Dr. J. G. Hawkes (England). The progeny of the F_1 and F_2 crosses were evaluated in the field for growth, vigor, amount of flowering and amount of fruit set. This study is an example of the ongoing effort by this project to assist Solanum taxonomists in solving taxonomic problems among the tuber-bearing Solanums.

Distribution of Stocks. Seed and tuber shipments were sent to potato workers in 23 states within this country and to those in 19 other countries. Shipments included 2,088 seed and 2,301 tuber samples of species introductions, and four seed and 407 tuber samples of germplasm developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project, involving species introductions.

Copies of a listing of 211 species introductions available in the form of tuber families (particularly for the benefit of potato projects without adequate greenhouse facilities) were distributed to 262 potato workers. This mailing elicited 20 responses that depleted most of the tuber families offered.

Evaluation of Stocks. The more recent accessions are being steadily evaluated for characters of economic importance through the cooperative efforts of state, federal, and foreign laboratories.

Usefulness of Findings. The major objective of the Potato Introduction Project is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir of useful breeding stocks. Breeders are constantly searching for new sources of superior germplasm and for ways to incorporate desirable new genes into adapted commercial varieties. Accomplishment of the major objective of this program must be measured largely by the succes with which new, improved varieties meet the needs of commercial production.

Two new potato varieties, Allagash Russet and Dakchip, were released for commercial production in 1979-1980. The number of foreign introductions entering into their pedigrees are 12 and nine, respectively. One hundred forty-six of the 150 potato varieties developed and released in the United States since 1932 have two or more foreign introductions in their pedigree. These varieties presently compose about 65 percent of the annual seed potato production in the United States.

Basic research programs conducted in several states and other countries continue to provide information concerning the potential value and diversity of the Solanum species, and consequently the knowledge necessary for more effective utilization of the IR-1 germplasm collection. During 1980, 31 papers, 20 abstracts, and 7 theses reported the use of Solanum introductions.

NORTH CENTRAL REGIONAL POTATO TRIALS - 1980

R. H. Johansen and Cooperators[1/]

Potato Cultivar Trials

The year 1980 marked the thirtieth year that the North Central Regional Cultivar Trials have been conducted. There are now 14 States and two Provinces participating in the trial, however, this past season the trial in Missouri was lost due to drought and extremely hot weather during the growing season. Many of the top cultivars grown in the United States and Canada today have been tested as clonal lines in the North Central Regional Trial prior to their introduction.

Recent Potato Cultivars

Progeny Number	Released	Released by	Release Name	Parentage
AK 37-19	1978	Alaska	Denali	B5141-6 X AK1-62-90-64
AK 34-2	1980	Alaska	Highlat Russet	B7196-25 X B7680-6
A68678-1	1980	Idaho & several co-op states	Lemhi	Pioneer X A63126-8
ND8891-3	1980	North Dakota	Crystal	Cascade X ND7196-18

Cooperating States and Provinces.

State or Province	Date Planted	Date Harvested	Total Days to Harvest
Alberta	5/9	9/23,30	155
Manitoba	5/15	9/16	125
Colorado	5/7,8	9/9	128
Indiana	5/13	9/24	135
Iowa	5/1	8/21	144
Kansas	4/4	8/5	124
Kentucky	4/3	8/25	155
Louisiana	2/5	6/4	121
Michigan	5/7	9/24	141
Minnesota	4/17	8/26	132
Nebraska	5/21	9/16	119
North Dakota	5/12	9/22	134
Ohio	5/1	9/11	134
South Dakota	4/30	9/22	146
Wisconsin	5/6	9/22	139

1/ Indiana, H. Erickson; Kansas, J Greig; Louisiana, J. Fontenot; Michigan R. Chase; Minnesota, F. Lauer; Missouri, V. Lambeth; Nebraska, R.O'Keefe; North Dakota, R. Johansen; Ohio, J. Pisarczyk; South Dakota, P.Prashar, Wisconsin, D. Kichefski, S. Peloquin & J. Schoenemann; USDA-R.Webb; Alaska, C. Dearborn; Alberta, S. Molar; Manitoba, W. Russell; USDA-Idaho, J. Pavek; Iowa, W. Summers; Colorado, C. Urano; Kentucky, J. Snyder.

Environmental Conditions. Soil type ranged from clay loam to sand. The Indiana trial was on organic soil or muck land.

Cultural Practices. Fertilizer, fungicides, insecticides, vine killers, herbicides, etc. were based on local conditions. The following herbicides were used: Eptam, Sencor, DCPA, Lasso, Treflan and Lorox. The most popular fungicides used were Dithane, M-45, Difolitan, Bravo, Maneb, fixed copper, and the insecticides used were Belmark, Sevin, Diazinon, Thiodan, Difolitan, Guthion, Monitor, Temik, Lannate, Kocide 101, Methoxychlor and Defend/Devinal. Fertilizer of different analysis ranged from 100 to 1500 pounds per acre, depending on the State or Province.

Weather and Growing Conditions. For the most part, it was extremely dry in the Midwest and Southern Canada during the early part of the growing season and extremely hot in the Southern United States throughout most of the growing season. For example, in Michigan, North Dakota, Alberta and Manitoba, not much over an inch of precipitation was recorded in May and early June. On the contrary, in Kentucky and Indiana it was wet and cool at planting time but very hot during the rest of the season. The severe heat of July and August stressed the weakened plants, resulting in the lowest yields ever recorded for the North Central Trial in Indiana. Louisiana had excessive rainfall and near normal temperatures. The Midwest and Southern Canada received a fair amount of precipitation during the latter part of the season which resulted in respectable yields. The extreme heat for several days eliminated the Missouri trial and caused very drastic low yields in Kansas. Irrigation water was applied to several of the trials.

Entries. Entries were received from North Dakota, Nebraska, Minnesota, Wisconsin, Louisiana and Alaska. Red Pontiac, Norland, Norchip and Russet Burbank were again the check cultivars with the seed being supplied by North Dakota. With the exception of Wisc. 806R, which was not sent to Louisiana, all entries were sent to all States and Provinces, making a very uniform trial for 1980. No yields were reported for Russet Burbank and Norchip in Indiana.

Total and U.S. No. 1 Yield. Red Pontiac produced both the highest total and U.S. No. 1 yield. Over the past years, Red Pontiac, a drought resistant cultivar, has consistently been one of the highest yielding entries in the North Central Trial and this year with the drought and high temperatures, this cultivar naturally produced high yields. The red skinned entries, Wisc. 806R and La. 42-38 also produced high yields. Line TND 14-1Russ, an attractive russet skin selection produced the lowest total yield, however it was quite comparable to Russet Burbank in U.S. No. 1 yield. Other high yielding entries were Neb.A129.69-1, Neb.A71.72-1 and Minn. 8757.

Minnesota and Wisconsin produced the highest yields. Because of the drought and high temperatures during the growing season, Indiana and Kansas produced very low yields. Louisiana also reported low yields due to adverse weather conditions. Total and U.S. No. 1 yields are found in North Central Regional Tables 1 and 2.

Percent U.S. No. 1. The drought and high temperatures along with other unfavorable weather conditions caused a low percent U.S. No. 1 for trials in Colorado, Indiana, Iowa, Kansas, Louisiana and Nebraska. Russet Burbank with 54 percent U.S. No. 1 tubers was lowest in the Trial (North Central Regional Table 3).

Maturity. Maturity is reported in North Central Regional Table 4. Line ND146-4R along with Norland were again the earliest maturing entries in trial; Neb. A 129.69-1 was the latest. Several entries that were reported to be in the medium to late maturity classification were actually in the early to medium early class.

Percent Total Solids. Line Wisc. 723, with an overall average of 19.0 percent was the highest in total solids (North Central Regional Table 5). Norchip and Russet Burbank had an overall average of 18.8 and 18.6 percent total solids.

Scab Reaction. Colorado, Indiana, Minnesota and Nebraska had the highest incidence of scab (North Central Regional Table 6). South Dakota, Kentucky, Alberta, Manitoba and Iowa reported a low incidence of scab.

Summary of Grade Defects. Grade defects are found in North Central Regional Table No. 7. Certain advanced breeding selections are starred to point out an external and internal defect. This is done only to make the person responsible for the selection aware of its weakness. Russet Burbank again showed a high amount of second growth.

Chip Quality. The best chipping entries were ND146-4R and Neb.A219.70-3. In most cases they had chip color lighter than Norchip. Line Wisc. 723 also had light chip color. Agtron and color chart readings for chip color are found in North Central Regional Table 8.

Overall Merit Ratings[1/]. Merit ratings are presented for 1978, 1979 and 1980. Line ND146-4R received the highest merit rating and was third in 1979. Complete merit ratings are found in North Central Regional Table 9.

Cultivar or Selection	Total Points		
	1978	1979	1980
ND146-4R		24	28
Neb. A129.69-1			25
Wisc. 726		29	23
Minn. 8757			20
Norchip	26	20	19

1/ Merit Ratings

Ratings	Points
1	5
2	4
3	3
4	2
5	1

North Central Regional Table 1. Total Yield (Cwt/Acre) - 1980.

Cultivar	Alb.	Manit.	Colo.	Ind.	Iowa	Kansas	Kent.	La.	Mich.	Minn.	Neb.	N.D.	Ohio	S.D.	Wisc.	Average
Early to Med. Early																
ND146-4R	492	260	335	31	263	121	244	86	307	490	379	176	227	236	418	271
Norland	478	335	326	186	292	192	255	103	328	461	380	181	327	222	439	300
Medium to Late																
Neb.A129.69-1	351	279	384	105	226	116	301	81	444	538	320	155	569	267	623	317
Neb.A71.72-1	526	432	423	70	261	110	354	137	404	595	336	187	448	247	611	343
Neb.A219.70-3	383	231	294	205	231	150	270	173	324	452	350	100	256	215	488	275
Minn. 8742	289	189	367	118	217	207	298	123	333	523	324	106	374	179	507	277
Minn. 8757	542	312	361	218	322	213	296	104	426	491	333	218	314	169	527	323
Minn. 9319	478	196	165	109	231	96	238	141	238	502	260	161	214	134	482	250
Wisc. 723	416	342	315	128	215	145	256	129	356		364	215	301	206	561	296
Wisc. 726	421	385	322	210	266	152	326	148	307	550	391	208	344	240	541	321
Wisc. 806R	597	353	452	141	277	113	452	497	445	635	375	162	459	200	598	354
La. 42-38	490	332	378	213	340	222	380	79	449	531	344	192	466	260	599	352
AK 34-2	346	303	196	78	299	119	301	72	248	425	296	150	404	192	430	257
TND 14-1Russ	257	197	213	65	244	108	162	22	258	356	290	134	314	174	365	211
Red Pontiac	624	423	625	217	356	216	351	193	621	697	455	243	574	260	770	442
Russet Burbank	492	336	379		206	13	332	68	436	603	289	212	341	195	667	326
Norchip	454	336	379		267	203	271	54	307	458	372	239	350	320	466	320
Average	449	308	348	123	265	147	300	101	367	518	345	179	370	219	535	308

North Central Regional Table 2. U.S. No. 1 Yield (Cwt/Acre) - 1980.

Cultivar	Alb.	Manit.	Colo.	Ind.	Iowa	Kansas	Kent.	La.	Mich.	Minn.	Neb.	N.D.	Ohio	S.D.	Wisc.	Average
Early to Medium Early																
ND146-4R	405	241	262	23	138	83	236	49	290	490	288	158	169	216	350	227
Norland	394	311	256	149	167	133	241	63	307	461	236	162	252	207	386	248
Medium to Late																
Neb. A129.69-1	283	252	278	57	120	56	261	37	428	538	234	143	505	252	599	270
Neb. A71.72-1	375	386	310	47	135	46	308	56	359	595	248	164	345	229	561	278
Neb. A219.70-3	320	221	218	146	116	84	229	122	314	452	224	80	200	205	466	226
Minn. 8742	235	176	287	97	85	93	197	63	310	523	233	78	265	172	484	220
Minn. 8757	468	301	241	203	174	144	253	81	416	491	196	194	253	175	510	273
Minn. 9319	362	179	108	93	120	53	186	68	229	502	127	151	164	128	462	195
Wisc. 723	335	323	239	104	87	78	247	59	334	497	226	188	237	197	534	246
Wisc. 726	297	365	244	181	170	77	288	59	292	550	223	199	282	230	520	265
Wisc. 806R	473	301	345	110	122	36	320		424	635	289	127	325	189	564	284
La. 42-38	377	285	253	166	186	162	276	26	423	531	220	172	382	238	582	285
AK 34-2	249	280	103	59	178	68	276	37	228	425	178	137	337	182	424	211
TND 14-1Russ	194	185	125	53	82	46	108	15	243	356	194	106	269	158	329	164
Red Pontiac	540	392	381	187	163	115	257	120	605	697	250	202	489	250	734	359
Russet Burbank	355	278	42		25		118	10	383	603	133	70	140	162	593	194
Norchip	299	297	251		109	94	229	21	279	458	164	209	302	304	424	229
Average	351	281	232	99	128	80	237	52	345	518	215	149	289	205	501	246

North Central Regional Table 3. Average Percent U.S. No. 1 over 2" Diameter - 1980.

Cultivar	Alb.	Manit.	Colo.	Ind.	Iowa	Kansas	Kent.	La.	Mich.	Minn.	Neb.	N.D.	Ohio	S.D.	Wisc.	Average
Early to Medium Early																
ND146-4R	82	93	78	73	52	69	96	57	95	100	76	89	75	92	84	81
Norland	82	93	79	80	57	69	95	61	94	100	62	89	77	93	88	81
Medium to Late																
Neb. A129.69-1	81	91	72	54	53	48	87	46	96	100	73	92	89	95	96	78
Neb. A71.72-1	71	90	73	67	52	42	85	41	89	100	74	87	77	93	92	76
Neb. A219.70-3	84	96	74	71	50	56	85	71	97	100	64	80	78	95	95	80
Minn. 8742	81	92	78	82	39	45	66	51	93	100	72	73	71	96	95	75
Minn. 8757	86	97	67	93	54	68	86	78	98	100	59	88	81	96	97	83
Minn. 9319	76	92	65	85	52	55	79	48	96	100	49	93	77	95	96	77
Wisc. 723	80	94	76	81	40	54	97	46	94	100	62	87	79	96	95	73
Wisc. 726	70	95	76	86	64	51	89	40	95	100	57	95	82	96	96	79
Wisc. 806R	79	86	77	78	44	32	71		95	100	77	78	71	94	94	77
La. 42-38	77	86	67	78	55	73	72	33	96	100	64	89	82	91	97	77
AK 34-2	72	93	53	76	60	57	92	51	92	100	60	91	83	95	99	78
TND 14-1Russ	75	93	59	82	34	43	66	68	94	100	67	79	86	91	90	75
Red Pontiac	86	93	61	86	46	53	73	62	97	100	55	83	85	96	95	78
Russet Burbank	72	83	11		12		35	15	88	100	46	33	41	83	89	54
Norchip	66	88	66		41	46	85	39	91	100	44	87	86	95	91	73
Average	78	91	67	69	47	51	80	47	94	100	62	83	78	94	93	76

North Central Regional Table 4. Maturity Classification[1/] - 1980.

Cultivar	Alb.	Manit.	Colo.	Ind.	Iowa	Kansas	Ken.	La.	Mich.	Minn[2/]	Neb.	N.D.	Ohio	S.D.	Wisc.	Average
Early to Medium Early																
ND146-4R	3.0	1.6	1.0	1.3	1.0	1.4	1.0	2.0	2.0		2.0	2.1	1.0	1.0	2.0	1.6
Norland	3.0	1.6	1.0	1.5	3.0	1.0	1.0	2.0	2.0		2.7	2.0	1.0	1.0	1.0	1.8
Medium to Late																
Neb. A129.69-1	4.0	4.0	2.5	4.5		5.0	5.0	5.0	5.0		4.0	5.0	5.0	4.8	5.0	4.5
Neb. A71.72-1	4.0	2.8	2.2	4.0	2.0	5.0	4.0	4.0	4.0		3.7	3.3	3.0	3.0	4.0	3.5
Neb. A219.70-3	4.0	2.8	2.0	4.5	1.0	4.0	3.0	4.0	3.0		3.0	3.4	2.0	2.0	3.0	2.9
Minn. 8742	4.0	2.4	2.0	3.0	1.0	2.5	3.0	3.0	3.0		3.0	2.6	2.0	1.0	3.0	2.5
Minn. 8757	4.0	2.9	2.0	3.5	3.0	3.2	3.0	3.0	3.0		2.7	3.5	2.0	1.8	3.0	2.9
Minn. 9319	3.0	2.8	1.3	3.3	2.0	2.3	4.0	5.0	3.0		2.7	3.0	3.0	1.0	3.0	2.8
Wisc. 723	5.0	3.1	1.5	4.0	2.0	3.0	4.0	3.0	4.0		3.7	3.8	3.0	2.5	4.0	3.3
Wisc. 726	5.0	2.8	2.0	3.7	3.0	5.0	4.0	4.0	4.0		3.0	3.8	3.0	2.8	4.0	3.5
Wisc. 806R	4.0	3.0	2.0	4.3	1.0	3.0	5.0		4.0		4.0	3.8	4.0	2.2	3.0	3.3
La. 42-38	4.0	3.8	2.5	5.0	2.0	4.5	4.0	5.0	4.0		4.3	4.3	4.0	3.0	4.0	3.8
AK 34-2	3.0	2.0	1.0	1.3	1.0	3.3	2.0	3.0	2.0		1.7	2.0	2.0	1.0	3.0	2.0
TND 14-1Russ	4.0	1.8	1.5	1.3	1.0	2.5	2.0	2.0	3.0		2.7	2.6	2.0	1.0	2.0	2.1
Red Pontiac	5.0	3.9	2.0	4.0	4.0	3.5	5.0	4.0	5.0		3.7	4.0	3.0	3.5	4.0	3.9
Russet Burbank	4.0	4.0	1.7		4.0	4.3	5.0	5.0	3.0		3.7	5.0	5.0	4.8	4.0	4.1
Norchip	4.0	2.8	2.7		3.0	4.8	4.0	3.0	3.0		3.0	3.0	3.0	1.8	3.1	3.1
Average	4.0	2.8	1.8	3.2	2.1	3.4	3.4	3.5	3.3		3.1	3.3	2.8	2.2	3.2	3.0

1/ 1. Very Early - Norland Maturity
2. Early - Irish Cobbler Maturity
3. Medium - Red Pontiac Maturity
4. Late - Katahdin Maturity
5. Very Late - Russet Burbank Maturity

2/ No data reported.

North Central Regional Table 5. Percent Total Solids - 1980.

Cultivar	Alb.	Manit.	Colo	Ind.	Iowa	Kansas	Kent.	La.	Mich.	Minn.	Neb.	N.D.	Ohio	S.D.	Wisc.	Ave.
Early to Medium Early																
NDl46-4R	19.3	19.0	16.0		13.0	17.2	15.5	16.0	15.8	16.7	18.8	18.6	16.7	17.2	15.8	16.8
Norland	19.0	17.7	16.9	13.3	12.6	14.0	13.5	15.2	15.1	15.3	17.1	18.8	15.4	16.6	14.0	15.6
Medium to Late																
Neb. A129.69-1	21.8	18.2	18.6	14.2	13.3	14.8	13.4	15.2	18.4	18.8	20.3	18.2	16.9	19.3	18.6	17.3
Neb. A 71.72-1	21.4	19.4	18.4	16.4	13.3	16.6	15.5	15.4	17.7	17.7	21.4	19.9	16.7	18.3	17.1	17.6
Neb. A219.70-3	21.8	19.0	18.4	15.9	13.3	15.7	15.5	15.6	17.7	17.3	20.1	19.4	17.2	17.7	17.1	17.4
Minn. 8742	21.8	20.2	17.3	17.3	12.8	16.1	14.9	15.2	17.3	19.0	16.0	19.9	15.6	19.3	17.5	17.3
Minn. 8757	18.8	18.5	16.9	14.4	12.8	14.8	14.4	15.2	15.8	15.8	18.4	18.4	15.4	16.7	15.2	16.1
Minn. 9319	22.3	21.4	17.5	16.2	13.0	16.6	16.5	15.2	18.0	19.8	20.5	20.3	15.6	18.6	16.7	17.9
Wisc. 723	22.0	22.1	18.6	16.6	13.9	16.6	18.0	15.2	19.9	20.6	23.1	22.0	18.3	20.0	19.2	19.0
Wisc. 726	19.9	21.7	18.2	16.8	14.3	17.0	15.9	15.2	19.9	20.5	21.2	19.7	17.3	18.2	18.4	18.2
Wisc. 806R	19.9	19.6	17.3	15.1	13.3	14.4	14.4		17.7	19.2	19.4	18.6	16.9	17.2	17.5	17.1
La. 42-38	21.3	20.5	19.4	15.7	13.3	15.7	16.0	15.2	19.0	19.6	20.7	20.5	16.9	18.3	18.8	18.0
AK 34-2	21.3	19.5	16.5	14.6	14.1	17.9	16.7	15.8	16.0	17.3	20.1	20.3	16.2	19.4	17.3	17.5
TND 14-1Russ	19.3	20.6	16.5	14.4	13.3	16.4	16.3		16.7	16.9	20.7	20.1	16.0	18.8	15.4	17.2
Red Pontiac	19.5	18.1	17.1	14.2	12.8	14.4	12.4	15.2	17.1	16.3	17.7	17.7	15.6	16.3	16.2	16.0
Russet Burbank	22.3	21.1	17.5		13.0	18.1	16.2	15.2	19.9	19.9	21.2	19.7	18.0	19.2	19.4	18.6
Norchip	22.7	21.1	18.2		14.3	16.1	17.4	16.5	18.4	19.0	21.4	20.9	18.2	19.6	18.8	18.8
Average	20.8	19.8	17.6	15.3	13.3	16.0	15.4	15.4	17.7	18.2	19.9	19.6	16.6	18.2	17.2	17.4

North Central Regional Table 6. Scab Reaction Report. Most Representative Scab (Area-Type)[1/] - 1980

Cultivar	Alb.	Manit.	Colo.	Ind.	Iowa	Kansas	Kent.	La.	Mich.	Minn.	Neb.	N.D.	Ohio	S.D.	Wisc.[2/]
Early to Medium Early															
ND146-4R		T-1	1-4	3-3	T-1	1-1	T-1		0-0	4-5	1-4	T-1	1-1	0-0	
Norland		1-2	1-3	2-3	T-1	3-1	T-1		T-1	2-3	2-3	1-1		0-0	
Medium to Late															
Neb. A129.69-1	T-1	T-1	1-4	3-2	T-1	3-1	T-1		1-4	5-3	1-4	T-1	1-1	0-0	
Neb. A71.72-1		T-1	1-3	1-1	T-1	3-1	T-1		1-4	5-5	1-3	T-1		T-1	
Neb. A219.70-3	T-1	1-3	1-3	2-4	1-5	3-2	T-1	T-1	0-0	2-3	1-3	1-2	1-4	2-2	
Minn. 8742		T-4	2-5	3-2	T-1	3-1	T-1	T-1	T-4	2-3	1-3	2-2	1-1	0-0	
Minn. 8757		T-1	1-4	3-3	T-1	2-1	T-1	T-1	T-3	2-3	1-4	T-1	1-4	0-0	
Minn. 9319			1-3	1-3	T-1	2-1	T-1		0-0	1-1	2-3	T-1		0-0	
Wisc. 723		1-1	1-3	1-1	T-1	2-1	T-1		T-2	4-4	1-2	2-3	1-4	T-2	
Wisc. 726	T-2	T-1	1-3	3-1	T-1	2-1	T-1		T-3	4-2	1-5	T-1	1-1	T-1	
Wisc. 806R			1-5	3-1	T-1	1-1	T-1		1-4	5-5	1-3	T-1	1-1	T-1	
La. 42-38		T-2	3-4	3-2	T-1	1-1	T-1		T-3	4-3	1-4	T-1	1-2	0-0	
AK 34-2		T-1	2-5	1-1	T-1	1-1	T-1		1-4	5-5	2-4	1-1	1-1	0-0	
TND 14-1Russ	T-1		2-4	1-1	T-1	1-1	T-1		0-0	5-4	1-4	0-0	1-4	0-0	
Red Pontiac		T-1	1-5	2-2	1-2	4-1	T-1		1-5	5-5	1-2	3-3	1-3	1-2	
Russet Burbank			0-0		T-1	1-1	T-1		0-0	2-3	0-0	0-0	1-3	1-2	
Norchip			1-5		T-1	2-1	T-1		0-0	2-2	1-5	T-1	1-1	T-1	

1/ AREA
T = less than 1%
1 = 1-20%
2 = 21-40%
3 = 41-60%
4 = 61-80%
5 = 81-100%

TYPE
1. Small, superficial
2. Larger, superficial
3. Larger, rough pustules
4. Larger pustules, shallow holes
5. Very large pustules, deep holes

2/ No data

North Central Regional Table 7. Summary of Grade Defects.-1980.

Cultivar	External					Internal			
	Scab	Growth Cracks	Second Growth	Sun Green	Total Free of[1] Ext. Defects	Hollow Heart	Internal Necrosis	Vascular Discoloration	Total Free of[1] Int. Defects
Early to Medium Early									
ND146-4R	6.5	3.2	4.6	0.8	83.1	0.3	.13	7.5	91.2
Norland	7.3	4.7	6.0	3.0	81.0	1.1	.73	7.0	89.5
Medium to Late									
Neb.A29.69-1	10.9*	2.2	6.4	3.0	79.7	2.6	1.00	7.2	83.4
Neb.A71.72-1	3.2	0.9	9.0	3.2	85.4	4.3*	4.40	14.7	72.2
Neb.A219.70-3	10.1*	6.4*	6.0	3.2	76.0	4.5*	1.40	8.8	67.4
Minn. 8742	11.9*	5.4	12.0*	3.7	72.4	5.4*	0.47	13.1	77.6
Minn. 8757	11.3*	5.7	6.7	2.2	75.0	1.6	2.40	5.2	84.9
Minn. 9319	4.0	5.4	7.6	2.5	80.7	1.0	0.30	17.2*	75.2
Wisc. 723	8.8	1.6	4.4	2.3	83.6	0.3	2.10	14.7	76.9
Wisc. 726	7.1	2.0	4.3	6.0*	82.3	2.2	2.20	15.3	75.3
Wisc. 806R	14.5*	1.4	7.5	1.4	73.4	2.8	5.20*	7.0	71.2
La. 42-38	7.1	4.0	6.3	2.0	80.8	3.1	0.80	7.6	83.1
AK 34-2	7.1	4.0	8.4	3.4	79.5	2.7	1.70	8.1	81.3
TND 14-1Russ	1.3	2.9	11.4	1.1	83.5	0.5	1.10	6.7	86.1
Red Pontiac	11.6*	3.2	10.1	1.9	74.2	2.1	0.60	8.9	82.5
Russet Burbank	2.2	2.6	42.2*	0.4	47.1	3.9	0.05	8.0	75.7
Norchip	6.0	6.7*	10.0	6.0*	67.1	0.8	2.70	10.5	75.1
Average	7.7	3.7	9.6	2.7	76.8	2.3	1.60	9.9	79.3

1/ Percent normal tubers showing no defects (some individuals had more than one type of defect).

* Possible weakness of cultivar or clone.

North Central Regional Table 8. Chip Quality.-1980.

Cultivar	Alb 1/	Manit 2/	Colo 1/	Ind.	Iowa	Kansas	Kent.	La 1/	Mich 1/	Minn.	Neb 1/	N.D 2/	Ohio 2/	S.D.	Wisc 1/
Early to Medium Early															
ND146-4R	5.7	43.3	3.0					3.0	2.0		3.0	46	65		4.3
Norland	6.7	34.8	3.0					6.0	3.0		4.0	33	42		7.0
Medium to Late															
Neb. A129.69-1	7.1	24.3	3.0					3.5	4.0		5.0	22	40		6.0
Neb. A71.72-1	8.0	33.5	3.0					4.6	3.0		4.0	30	44		3.4
Neb. A219.70-3	7.0	45.0	3.0					2.4	1.0		3.0	40	63		3.6
Minn. 8742	8.5	26.8	4.0					4.0	2.0		6.0	19	32		7.0
Minn. 8757	8.3	24.8	3.0					5.3	3.0		7.0	19	26		6.0
Minn. 9319	5.5	40.8	4.0					3.3	1.5		3.0	35	47		3.7
Wisc. 723	6.1	40.5	3.0					2.9	2.0		3.0	30	55		4.0
Wisc. 726	7.3	39.5	3.0					3.5	3.0		3.0	43	58		3.4
Wisc. 806R	9.3	29.3	3.0						3.5		7.0	21	52		6.0
La. 42-38	8.3	29.5	3.0					3.9	3.0		7.0	25	46		7.0
AK 34-2	7.5	32.8	3.0					3.3	2.5		5.0	27	50		6.3
TND 14-1Russ	6.3	38.3	3.0						2.0		4.0	29	57		5.4
Red Pontiac	8.2	20.8	4.0					3.5	4.0		6.0	21	35		8.0
Russet Burbank	6.3	35.3	4.0					3.8	4.0		6.0	27	47		6.5
Norchip	5.0	46.3	3.0					1.6	1.5		3.0	42	57		3.7
Average	7.1	34.4	3.2					3.6	2.6		4.6	30	48		5.3

1/ PCII Color Chart (1 lightest; 10 darkest)

2/ Agtron (Highest number lightest)

North Central Regional Table 9. Merit Ratings[1/] - 1980.

Cultivar	Alb.	Manit.	Colo.	Ind.	Iowa	Kansas	Kent.	La.	Mich.	Minn.	Neb.	N.D.	Ohio	S.D.	Wisc.	Total Points
Early to Medium Early																
ND146-4R	4	1	4			2	2		2	3	5	5				28
Norland	3			2	2	4	1									12
Medium to Late																
Neb. A219.69-1			5				5				1		5	5	4	25
Neb. A71.72-1	2	2	1							2	2		1	1	1	12
Neb. A219.70-3						1		5								6
Minn. 8742										4						4
Minn. 8757	5			4	3		4	4								20
Minn. 9319								2	5	1						8
Wisc. 723								1			4	2			3	10
Wisc. 726		5	2	5	5		3					3				23
Wisc. 806R			3						3	5	3					14
La. 42-38	1			3	4	5									2	15
AK 34-2									1				4	4		9
TND 14-1Russ									4			1				5
Red Pontiac				1	1	3		3					2	2		12
Russet Burbank		3														3
Norchip		4										4	3	3	5	19

1/ Merit Ratings

Rating	Points
1	5
2	4
3	3
4	2
5	1

WESTERN REGIONAL POTATO VARIETY TRIAL - 1980

J. J. Pavek, D. L. Corsini, and Cooperators[1/]

The 1980 Western Regional Potato Variety Trial was uniformly grown at nine locations. A seed distribution problem prevented the tenth location (Malheur Co., Oregon) from growing all of the entries. The trial was also planted at two other locations (Wyoming, Manitoba) but problems there with inadequate moisture precluded the collection of meaningful data. The trial consisted of 12 entries including nine experimental clones. The trial locations, planting and harvest dates, and days from planting to harvest were as follows:

State/ Province	Location	Planting Date	Harvest Date	Days to Harvest
Alberta	Brooks	5/12	9/29	140
California	Kern Co.	2/25	6/16	111
"	Tulelake	5/13	9/24	134
Colorado	San Luis Valley	5/20	9/22	125
Idaho	Aberdeen	4/30	9/30	153
"	Kimberly	4/23	10/8	168
Oregon	Hermiston	4/9	9/30	174
"	Malheur Co	4/24	10/13	172
Washington	Othello	4/17	9/17	153
"	Prosser	4/11	9/10	152

Cultural practices, use of fertilizer, pesticides, irrigation, and vine killing varied according to local conditions. All locations were irrigated on a regular schedule throughout the entire growing season. Temperatures across the region averaged somewhat below normal for much of the season. Data on tuber yields, vine and tuber characteristics, and merit ratings are presented in Western Tables 1 through 7. Experimental clones to be retained in the 1981 trials are A72545-2, AD7267-1, AD7377-1, WC521-12, and WC672-2. Red-skinned AC67560-1 may be named and released in 1981.

[1/] Alberta, D. Lynch; California, R. Voss; Colorado, J. Twomey; Idaho, G. Kleinschmidt, S. Michener; Oregon, A. Mosley, M. Johnson, C. Stanger, G. Carter; Washington, M. Martin, W. Iritani, N. Holsted; Wyoming, K. Bohnenblust.

Western Table 1. Total Yield cwt/acre.

Entry	California		Colo	Idaho		Oregon		Washington			Overall
	Kern	Tul	SLV	Ab	Kim	Herm	Mal	Oth	Pros	Alb	Mean
A72545-2	-	-	406	420	342	582	411	930	881	260	545 a*
B6987-184	430	490	338	322	91 1/	453	-	524	689	248	398 cd
AC67560-1	365	550	428	352	264	440	330	642	753	296	454 bc
WC521-12	380	495	418	357	384	714	-	699	887	279	513 ab
WC612-13	460	480	442	528	404	613	-	930	1024	360	582 a
WC672-2	365	520	427	404	401	593	699	812	902	303	525 ab
AD7267-1	510	645	413	356	394	623	-	732	960	378	546 a
AD7377-1	340	605	430	448	495	552	-	912	1065	331	575 a
WD641-10	245	365	292	306	232	228	-	471	652	283	342 d
Atlantic	465	750	437	388	326	496	-	681	799	349	521 ab
Lemhi Russet	360	645	389	402	426	645	570	822	980	383	561 a
Russet Burbank	455	615	378	379	414	563	760	854	725	335	524 ab
Location Means	398	561	400	389	348	542		751	860	309	506

*Duncan's Multiple Range Test using locations as reps (P=.05).

1/Severe metribuzin injury reduced yield.

Western Table 2. Yield of U.S. No. 1's cwt/A and percent.

Entry	California		Colo	Idaho		Oregon		Washington		Alb	Mean	%
	Kern	Tul	SLV	Ab	Kim	Herm	Mal	Oth	Pros			
A72545-2	-	-	328-81	366-87	313-92	533-92	387-94	838-90	801-91	198-76	482 a*	88
B6987-184	375-87	430-88	261-77	253-79	66-73	378-83	-	392-75	586-85	135-54	320 de	80
AC67560-1	340-93	470-85	326-76	282-80	239-91	392-89	289-88	559-87	676-90	218-74	389 bcd	86
WC521-12	340-89	440-89	345-83	309-87	340-89	613-86	-	618-88	817-92	204-73	447 abc	87
WC612-13	410-89	410-85	373-84	475-90	339-84	558-91	-	759-82	922-90	251-70	500 a	86
WC672-2	340-93	440-85	364-85	328-81	349-87	553-93	607-87	706-87	785-87	244-81	457 ab	87
AD7267-1	485-95	555-86	310-75	301-85	345-88	537-86	-	632-86	864-90	143-51	464 a	85
AD7377-1	330-97	530-88	349-81	358-80	325-66	474-86	-	810-89	948-89	164-50	476 a	83
WD641-10	230-94	300-82	252-86	261-85	214-92	184-81	-	395-84	580-89	179-63	288 e	84
Atlantic	425-91	680-91	346-79	333-86	293-90	463-93	-	584-86	631-79	212-61	441 abc	85
Lemhi Rus	350-97	560-87	310-80	296-74	374-88	567-88	551-97	702-85	891-91	267-70	480 a	86
Russet B.	350-77	475-77	229-61	241-64	264-64	378-67	587-77	669-78	623-86	186-56	379 cd	72
Location Means	361	481	316	317	288	469		639	760	200	427	

*Duncan's Multiple Range Test using locations as reps (P=.05).

Western Table 3. U.S. No. 1's over 10/12 oz percent of total yield.*

Entry	California		Colo	Idaho		Oregon		Washington			Overall
	Kern	Tul	SLV	Ab	Kim	Herm	Mal	Oth	Pros	Alb	Mean
A72545-2	-	-	19	59	47	11	65	58	69	30	40
B6987-184	6	8	14	27	7	9	-	19	62	19	20
AC67560-1	10	16	31	41	54	10	48	46	63	16	35
WC521-12	18	22	31	50	62	16	-	47	72	29	41
WC612-13	2	10	20	56	46	12	-	37	62	13	31
WC672-2	10	26	15	24	29	12	52	35	55	19	27
AD7267-1	17	29	33	57	65	14	-	54	71	21	43
AD7377-1	10	15	30	49	40	14	-	40	68	11	33
WD641-10	4	25	35	45	46	8	-	31	63	23	34
Atlantic	3	9	10	40	29	9	-	22	46	15	22
Lemhi Russet	11	21	27	33	54	14	76	32	57	31	33
Russet Burbank	2	10	20	33	19	10	41	27	53	26	24

*Calif. >12 oz, rest >10 oz except Herm. which is average tuber weight in oz.

Western Table 4. U.S. No. 2's and culls, percent of total yield.

Entry	California		Colo	Idaho		Oregon		Washington			Overall
	Kern	Tul	SLV	Ab	Kim	Herm	Mal	Oth	Pros	Alb	Mean
A72545-2	-	-	19	13	8	8	6	10	16	22	14
B6987-184	12	12	24	22	27	16	-	25	21	29	21
AC67560-1	7	15	24	20	9	12	13	12	20	25	16
WC521-12	10	11	17	14	11	14	-	12	12	27	14
WC612-13	11	14	15	10	16	9	-	19	16	27	15
WC672-2	7	16	15	19	12	7	12	13	21	20	15
AD7267-1	5	15	26	15	12	14	-	14	14	41	17
AD7377-1	2	12	28	20	34	14	-	12	17	41	20
WD641-10	6	18	14	15	8	19	-	19	17	33	17
Atlantic	8	9	21	14	11	8	-	14	32	32	16
Lemhi Russet	2	13	21	26	12	11	4	15	16	25	14
Russet Burbank	21	22	40	37	36	33	23	22	24	29	29

Western Table 5. Specific gravity.

Entry	California		Colo	Idaho		Oregon	Washington		Alb	Overall Mean
	Kern	Tul	SLV	Ab	Kim	Herm	Oth	Pros		
A72545-2	-	-	1.086	1.075	1.080	1.083	1.083	1.070	1.084	1.081 c*
B6987-184	1.097	1.093	103	98	93	99	96	87	98	96 a
AC67560-1	82	81	75	68	69	71	76	68	77	74 d
WC521-12	97	89	103	95	96	99	101	93	101	97 a
WC612-13	98	88	94	86	89	91	95	88	72	89 b
WC672-2	96	77	91	87	93	86	91	78	95	88 b
AD7267-1	82	70	69	65	68	74	72	70	67	71 d
AD7377-1	78	64	73	68	72	72	79	70	70	72 d
WD641-10	92	79	88	81	81	80	75	74	90	82 c
Atlantic	98	88	105	89	95	92	88	82	99	93 a
Lemhi Russet	91	83	93	84	88	87	90	82	95	88 b
Russet Burbank	98	83	87	77	86	91	89	81	88	87 b
Location Means	91	81	89	81	84	85	86	79	86	85

*Duncan's Multiple Range Test using locations as reps (P=.05).

Western Table 6. Summary of vine characteristics.

Entry	Seed source	Emergence (2 Loc)	Stand % (8 Loc)	Metribuzin injury (Kim)	Seedborne virus[3/] (Ab)	Vine size (Ab)	Vine maturity (4 Loc)	Vert. wilt	Early blight
A72545-2	(Or)	3.0[1/]	84	1.8[2/]	50% Mos	V. Lrg.	3.9[4/]	0.9[5/]	3.0[5/]
B6987-184	(Wn)	3.0	87	4.0	8% Mos	Med.	2.4	3.5	4.1
AC67560-1	(Or)	3.5	86	1.8	10% LR 8% Mos	Med.	3.1	3.5	4.3
WC521-12	(Or)	3.0	80	2.7	0	Lrg.	2.9	3.0	3.5
WC612-13	(Or)	3.0	93	3.0	0	Lrg.	4.0	1.4	3.1
WC672-2	(Co)	3.0	85	2.5	0	Lrg.	3.2	2.7	3.6
AD7267-1	(Ca)	3.0	88	2.8	8% LR 23% Mos	Lrg.	2.8	1.8	3.2
AD7377-1	(Ca)	3.0	90	1.2	0	Lrg.	3.4	1.3	2.9
WD641-10	(Ca)	4.0	77	1.3	0	M.Sm.	3.5	2.9	3.8
Atlantic	(Or)	3.0	91	3.5	0	M.Sm.	2.9	4.0	4.0
Lemhi Russet	(Id)	3.2	87	2.0	0	Lrg.	3.1	2.6	4.0
Russet Burbank	(Or)	2.5	94	2.5	10% Mos	Lrg.	3.4	3.3	3.5

1/ Emergence: 1 (earliest) to 5 (Latest).
2/ Metribuzin injury: 1 (none), 2 (slight), 3 (moderate), 4 (severe), 5 (wiped out).
3/ Based on visual symptoms at Aberdeen. Mosaic (symptoms) not identified as due to PVX or PVY.
4/ Vine maturity: 1 (earliest) to 5 (latest).
5/ Verticillium wilt and Early blight: 0 (none) to 5.0 (maximum) (mean of Aberdeen & Prosser only).

Western Table 7. Tuber type, scab, hollow heart, and merit rating scores.

Entry	Tubers[1]				Merit Rating Scores[4]									
					California		Colo	Idaho		Oregon	Washington			
	Shape	Skin	Common scab (4 Loc)	Hollow heart %[3]	Kern	Tul	SLV	Ab	Kim	Herm	Oth	Pros	Alb	Total Score
A72545-2	O	Buff	1.9[2]	2					2		3	2	4	11
B6987-184	O-R	Buff	2.8	2										0
AC67560-1	R±	Red	2.6	<1			5	2	4				1	12
WC521-12	R-O	Buff	2.6	3	3					5	4	3		15
WC612-13	R-O	Buff	4.1	1			2			2		5	2	11
WC672-2	R-O	Buff	3.0	4	1		1		1	1			3	7
AD7267-1	L-O	Rus.	1.4	7	5	4		1		3				13
AD7377-1	L-O	Rus.	1.3	2	2	1	3	3			1	1		11
WD641-10	O	Rus.	1.6	1				4	3					7
Atlantic	R	Buff	3.1	7	4	5								9
Lemhi Rus.	L-O	Rus.	1.0	4		3	4	5	5	4	5	4	5	35
Russet B.	L	Rus.	1.1	5		2					2			4

[1] Shape: O=oblong, R=round, L=long; Skin: Buff=scaly or flaky, not smooth and white; Rus.=russet.
[2] Scab: 0 (none) to 5.0 (most severe).
[3] Hollow heart: mean of 9 locations.
[4] Merit Rating

Rank	Score
1	5
2	4
3	3
4	2
5	1

NATIONAL TRIALS OF POTENTIAL ETHANOL LINES

Mark W. Martin and Cooperators [1/]

National Trials Organized. In 1980 I was asked to coordinate trials across the U.S. to determine the feasibility of growing potatoes as a biomass crop for ethanol production. These trials were to be funded with a federal alternate fuels grant but the money did not make it through the DOE decision making process. I am grateful to cooperators (listed below) in the states of Maine, North Dakota, Nebraska, Idaho and Washington who consented to grow these trials with this promise of funding and then had to conduct them at their own expense. Gary Kleinschmidt and Art Walz conducted potato biomass trials of their own in Idaho and have consented to let us report their results.

Lines Tested. By telephone consultation with the cooperators involved it was decided to all test a core group of 14 lines and then add others which were good candidates in our own area or for which we had only limited seed. The core group of lines and sources of seed were: Kennebec (local), Red Pontiac (local), Lemhi (local and Idaho), Crystal (North Dakota), Atlantic (local), Russet Burbank (local), A503-43 (local and Idaho), Wn C 612-13 (Colorado), B6987-201 (Washington - but B6987-184 was sent by mistake), Bounty, Neb. S1-3, 210-2, 12.72-2, and A129.69-1 (all from Nebraska).

Growing Season. The growing season in Washington and Idaho was one of the best ever for potatoes, with very little heat stress throughout the summer. Yields in Idaho were lower than expected because the trial at Aberdeen happened to fall in a part of the field with poor soils and the trial at Kimberly was injured early in the season by metribuzen herbicide. In North Dakota, Nebraska and Maine the growing season was very hot and dry and the harvest season unusually wet. This resulted in low yields in North Dakota and Maine, where irrigation is not used, and in lower than expected solids.

Results. Results of these trials indicate that growing potatoes as a biomass for ethanol production could be either very profitable or very expensive, depending on which cultivars were grown and where they were grown (Tables 2-11). Results from Nebraska were not available as this was written. High yields normally obtained in southwest Idaho and up through eastern Oregon and eastern Washington would make potato production for ethanol feasible and potentially very profitable, especially if high-yielding cultivars like White Rose, Kennebec and Red Pontiac are grown over a long season (Table 2). Yields of 50 to 70 T/A were obtained in these small plot trials, which it is estimated would convert to 1000 to 1300 gallons of ethanol/A, far more than corn or other proposed ethanol crops. The vines of some of these high-yielding, early-dying-resistant lines, could also make a significant contribution to the production of ethanol and high protein byproducts. Lines like

---

1/ Idaho, J. Pavek, D. Corsini, G. Kleinschmidt, A. Walz; Maine, R. Webb; Nebraska, R. O'Keefe; North Dakota, R. Johansen.

Wn 708-27 and Wn 705-111 produced from 55 to 75 T/A of tops in these small, single row plots, because they overgrew adjoining plots of commercial cultivars. It is estimated that such lines could produce up to 40 T/A of tops on a large acreage basis, which could convert to 300 gallons of ethanol/A and 5 T/A of 20% protein byproduct, paying the cost of extracting the ethanol from both the tubers and tops.

Whether potatoes can be profitably grown for ethanol depends to a great extent on the extraction costs of the ethanol and how much of this can be recovered by sale of byproducts. This would be particularly true in most areas outside the Columbia Basin area of Oregon and Washington, because the estimated cost of growing the crop in most areas is about the same as the value of the ethanol that might be obtained. Whether potatoes can be economically used for ethanol also depends on many complex supply and demand factors. The high potato prices in 1980, resulting from a short supply, would have made it uneconomical to make ethanol from any potatoes except those not suitable for human consumption. To insure a constant supply of potatoes ethanol factories would have to have them grown under contract. The growing of ethanol potatoes would probably be a separate industry from the growing of potatoes for culinary purposes, and would probably involve high yielding varieties not usable for fresh market or processing.

Nationwide, probably the leading candidate as an ethanol variety is A503-42 (Tables 2, 5, 7, 8, 9, 11). It is consistently high yielding and has good solids. Other lines that show promise and deserve further testing are Denali, A68113-4, A72545-2, A74595-11, A75708-9, A74771-4, Wn C 612-13, Wn 705-111 and Wn 708-27. Several others also showed some promise and probably should be retested. Many new clones were probably selected in 1980 by breeders interested in this new use of potatoes. These will be screened locally and seed increased of the more promising for widescale testing, to determine if they will produce higher yields of fermentable carbohydrates/A than the lines tested in 1980.

Ethanol Yield Estimates. We soon found that there was little information available regarding the production of ethanol from potatoes. It is generally assumed that technology for extracting ethanol from potatoes is available but we were unable to find anyone in the U.S. who had successfully done it on a large scale or over a long period. The literature indicated that from 1 to 1.4 gallons of ethanol could be extracted from a hundredweight of potatoes, with 1.25 gallons being the figure most commonly used. Those who had actually extracted ethanol from potatoes agreed, however, that this estimate was too high. There is only about a 85% conversion efficiency of starch to ethanol with the techniques presently used. I reviewed the literature on the relationships between specific gravity, solids, starch, sugars and talked with many who had conducted studies on these relationships. From the information collected I developed Table 1 which has many "ifs" connected to it but provides a reasonable estimate of the amount of ethanol that might be extracted from a cwt of potatoes at various specific gravity levels. Since every cultivar differs in these relationships and environment plays such an important part, it is impossible to come up with exact figures that would hold under all circumstances. The estimates in Table 1 seem to conform fairly closely to actual yields of ethanol which are being obtained by the few ethanol factories trying to use potatoes. The details of how these estimates were computed and used in converting our trial results into gallons

of ethanol/A and dollar value are shown in the footnotes of Tables 1 and 2. Hopefully, research will soon be initiated at various locations across the U.S. to obtain the data needed to confirm or make adjustments in Table 1.

Washington Table 1. Converting Specific Gravity Readings to % Solids, % Starch, % Sugar, % Fermentable Carbohydrates and Gallons of Ethanol/cwt (all estimates based on review of literature)

Specific Gravity	% Solids [1]	% Starch [2]	% Sugar [3]	% Fermentable Carbohydrates [4]	Gallons Ethanol/cwt [5]
1.060	16.8	10.7	3.0	13.7	0.88
1.061	17.0	10.9	2.9	13.8	0.89
1.062	17.2	11.1	2.9	14.0	0.90
1.063	17.4	11.3	2.8	14.1	0.91
1.064	17.6	11.5	2.8	14.3	0.92
1.065	17.8	11.7	2.7	14.4	0.93
1.066	18.0	11.9	2.7	14.6	0.94
1.067	18.2	12.1	2.6	14.7	0.95
1.068	18.4	12.3	2.6	14.9	0.96
1.069	18.6	12.5	2.5	15.0	0.97
1.070	18.8	12.7	2.5	15.2	0.98
1.071	19.0	12.9	2.4	15.3	0.99
1.072	19.2	13.1	2.4	15.5	1.00
1.073	19.4	13.3	2.3	15.6	1.01
1.074	19.6	13.5	2.3	15.8	1.02
1.075	19.8	13.7	2.2	15.9	1.03
1.076	20.0	13.9	2.2	16.1	1.04
1.077	20.2	14.1	2.1	16.2	1.05
1.078	20.4	14.3	2.1	16.4	1.06
1.079	20.6	14.5	2.0	16.5	1.07
1.080	20.8	14.7	2.0	16.7	1.08
1.081	21.0	14.9	1.9	16.8	1.09
1.082	21.2	15.1	1.9	17.0	1.10
1.083	21.4	15.3	1.8	17.1	1.11
1.084	21.6	15.5	1.8	17.3	1.12
1.085	21.8	15.7	1.7	17.4	1.13
1.086	22.0	15.9	1.7	17.6	1.14
1.087	22.2	16.1	1.6	17.7	1.15
1.088	22.4	16.3	1.6	17.9	1.16
1.089	22.6	16.5	1.5	18.0	1.17
1.090	22.8	16.7	1.5	18.2	1.18
1.091	23.0	16.9	1.4	18.3	1.19
1.092	23.2	17.1	1.4	18.5	1.20
1.093	23.4	17.3	1.3	18.6	1.21
1.094	23.6	17.5	1.3	18.8	1.22
1.095	23.8	17.7	1.2	18.9	1.23
1.096	24.0	17.9	1.2	19.1	1.24
1.097	24.2	18.1	1.1	19.2	1.25
1.098	24.4	18.3	1.1	19.4	1.26
1.099	24.6	18.5	1.0	19.5	1.27
1.100	24.8	18.7	1.0	19.7	1.28

[1/] Computed by using formula (201.72 x S.G.) - 196.98 = % Solids (Fitzpatrick, et al. 1969, Amer. Pot. J. 46:126).

[2/] Computed by multiplying % Solids by a variable ranging from 64% at S.G. 1.060 to 76% at S.G. 1.100. This percentage variable is based on analytical work of M. Maercker-Landwerth.

[3/] An estimated figure based upon analytical work by Schwimmer et al. 1954. Agr. and Food Chem. 2:1284-1289. These estimates are for % reducing sugars only so are low because sucrose and other sugars are also present. The amount and form of sugar present is influenced by storage temperatures and many other factors but in most cases will make a significant contribution to total % fermentable carbohydrates.

[4/] Computed by adding estimated % sugar to % starch.

[5/] Computed by multiplying % fermentable carbohydrates times 100 lbs to estimate the carbohydrate/cwt. Theoretically 0.5 lb of ethanol will be obtained from each lb of this carbohydrate but in actual practice only about 85% conversion efficiency or 0.425 lbs of ethanol/lb of carbohydrate is attained. Therefore, lbs carbohydrate/cwt was multiplied by 0.425 to obtain lbs ethanol /cwt and this was divided by 6.6, the weight of a gallon of ethanol to obtain the gallons of ethanol/cwt shown.

Washington Table 2. Sunheaven Ranch, Prosser - trial of potential ethanol lines - planted Apr. 11, harvested Sept. 10/80 (155 days) - tops harvested Sept. 5/80.

Line	Tubers				Tops		Total	Value
	Cwt/A [1]	S.G.	% Carbo [2]	Gal Eth/A [2]	Cwt/A	Gal Eth/A [3]	Gal Eth/A [4]	@ $1.70/gal [5]
White Rose	1311	1.073	15.5	1324	645	207	1531	$ 2603
Kennebec	1360	1.071	15.1	1346	547	176	1522	2587
Red Pontiac	1406	1.069	15.0	1364	311	100	1464	2489
Wn 708-27	985	1.066	14.4	926	1514	487	1413	2402
Wn 705-111	905	1.081	16.8	986	1128	363	1349	2293
Wn C 612-13	1035	1.086	17.5	1180	522	168	1348	2292
A503-42	1109	1.075	15.9	1142	508	163	1305	2219
Lemhi	991	1.081	16.8	1060	406	131	1191	2025
Rus Burbank	922	1.080	16.9	996	491	158	1154	1962
AD73116-1	895	1.069	15.0	868	489	157	1025	1743
B6987-184	823	1.090	18.2	971	166	54	1025	1743
A70365-6	911	1.070	15.2	893	251	81	974	1656
Atlantic	756	1.086	17.5	862	90	29	891	1515
Pioneer	899	1.066	14.4	845	123	40	885	1505
Wn D 634-4	669	1.066	14.4	629	58	19	648	1102

[1] Ave. yield of Rus Burbank circle in which this trial was grown was 770 cwt/A which is 16% lower than the Rus Burbank yield we obtained.

[2] Used attached table for converting specific gravity readings to % fermentable carbohydrates and Gal Ethanol/cwt. Multiplied Gal Eth/cwt times Cwt/A to compute Gal Eth/A.

[3] Analysis of tops indicates they are 10% dry matter with 50+% of this being carbohydrate or about 5% on a fresh weight basis. Therefore, weight of carbohydrate was computed by multiplying cwt/A by 5 and converting this carbohydrate weight to ethanol weight and gal/A as explained above and on Washington Table 1.

[4] Computed by adding ethanol/A from tubers to ethanol/A from tops.

[5] Estimated value of ethanol/A computed by multiplying Gal Eth/A by $1.70, the current value of 200 proof ethanol. Some feel the real value is more nearly $1/gal, the wholesale value of unleaded gasoline. The cost of producing the potato crop would be about $1000/A. It is assumed that the value of the high protein byproduct will cover the cost of producing the ethanol after the feedstock is brought into the distillery.

Washington Table 3. Other trials on Sunheaven Ranch, Prosser - lines to be considered for ethanol production - planted Apr. 11, harvested Sept. 10 (155 days)

Line	Cwt/A 1/	S.G.	% Carbo 2/	Gal Eth/A 3/	Value 4/
A74708-9	1137	1.078	16.4	1205	$ 2049
Wn C 612-13	1024	1.088	18.0	1188	2020
A74595-11	1051	1.083	17.2	1167	1984
A74771-4	1119	1.075	15.9	1153	1960
Kennebec	977	1.083	17.2	1084	1843
Lemhi	980	1.082	17.0	1078	1833
A68588-16	1023	1.077	16.2	1074	1826
Wn C 521-12	887	1.093	18.7	1073	1824
A74595-15	1004	1.078	16.4	1064	1809
78Ds-50	936	1.084	17.4	1048	1782
AD7377-1	1065	1.070	15.2	1044	1775
A7596-1	855	1.089	18.1	1000	1700
Wn C 672-2	902	1.078	16.4	956	1625
AD7267-1	960	1.070	15.2	941	1600
ADWn 75121-1	996	1.066	14.6	936	1591
78Ds-25	885	1.076	16.1	920	1564
A74117-9	882	1.075	15.9	908	1544
A74389-1	836	1.080	16.7	903	1535
Atlantic	799	1.083	17.2	887	1508
78Ds-181	784	1.084	17.3	878	1493
A67142-1	789	1.082	17.0	868	1476
A72545-2	881	1.070	15.2	863	1467
Rus Burbank	725	1.081	16.8	776	1319

1/ - 4/ See footnotes below Washington Table 2.

Washington Table 4. Lines from earliness trial at Prior Land Company, Paterson, to be considered for early season ethanol production - planted Mar. 27, harvested Jul. 22 (118 days)

Line	Cwt/A	S.G.	% Carbo 1/	Gal Eth/A 2/	Value 3/
A74365-2	701	1.072	15.5	701	$ 1192
A7273-3	675	1.072	15.5	675	1148
A7069-7	645	1.076	16.1	671	1141
Wn 775-26	654	1.072	15.5	654	1112
A68588-16	693	1.064	14.3	624	1061
A74117-9	618	1.072	15.5	618	1051
White Rose	689	1.061	13.8	613	1042
Wn C 521-12	535	1.086	17.6	6.0	1037
Kennebec	625	1.069	15.0	606	1030
A67142-1	631	1.067	14.7	599	1018
Lemhi	604	1.070	15.2	592	1006
ADW75121-1	664	1.059	13.5	578	983
ADW75201-12	550	1.075	15.9	567	964
Wn C 672-2	544	1.075	15.9	560	952
Wn C 612-13	516	1.079	16.5	552	938
78Ds-99	494	1.081	16.8	529	899
Rus Burbank	468	1.073	15.6	473	804

1/ - 3/ See footnotes below Washington Table 2.

Cost of production estimated at $900/A, if grown for ethanol.

Washington Table 5. Research Center, Roza Unit, Prosser, - trial of potential ethanol lines grown under water stress conditions using furrow irrigation - planted May 15, harvested Oct. 8/80 (147 days)

Line	Cwt/A	S.G.	% Carbo 1/	Gal Eth/A 2/	Value 3/
A503-42	662	1.079	16.5	708	$ 1204
Crystal	604	1.080	16.7	651	1108
Kennebec	565	1.080	16.7	6.0	1037
Wn 705-111	491	1.093	18.6	594	1010
White Rose	567	1.076	16.1	590	1003
Neb. S1-3	585	1.072	15.5	585	995
A70365-6	567	1.075	15.9	584	993
Rus Burbank	521	1.083	17.1	578	983
Lemhi	477	1.090	18.2	563	957
Bounty	565	1.071	15.3	559	950
Norchip	501	1.083	17.1	556	945
Wn C 612-13	466	1.089	18.0	545	927
B6987-184	415	1.100	19.7	531	903
Wn D 634-4	477	1.082	17.0	525	893
Rus Burbank 307	443	1.084	17.3	496	843
Atlantic	378	1.096	19.1	469	797
Neb. 12.72-2	461	1.070	15.2	452	768
Red Pontiac	454	1.068	14.9	436	741
Neb. 210-2	383	1.076	16.1	398	677

1/ - 3/ See footnotes below Washington Table 2.

Cost of production estimated at $900/A, if grown for ethanol.

Washington Table 6. Lines from Regional Trial, Othello, to be considered for ethanol production - planted Apr. 17, harvested Sept. 17/80 (154 days)

Line	Cwt/A	S.G.	% Carbo 1/	Gal Eth/A 2/	Value 3/
Wn C 612-13	930	1.095	18.9	1144	$ 1945
A72545-2	930	1.083	17.1	1032	1754
Rus Burbank	854	1.089	18.0	999	1698
AD7377-1	912	1.079	16.5	976	1659
Lemhi	822	1.090	18.2	970	1649
Wn C 672-2	812	1.091	18.3	966	1642

1/ - 3/ See footnotes below Washington Table 2.

Cost of production estimated at $900/A, if grown for ethanol.

Idaho Table 7. Trial at Aberdeen of potato lines that might be considered for use as biomass for ethanol production - 1980.

Line	Cwt/A	% Solids	Gal Eth/A 1/	$ Value 2/
A503-42	542	21.9	618	$ 1051
A681113-4	563	21.3	625	1063
Red Pontiac	570	18.5	553	940
Wn C 612-13	464	22.5	543	923
A67142-1	476	21.3	528	898
12-72-2	472	19.3	477	811
Atlantic	348	23.5	468	796
Bounty	421	20.5	450	765
S1-3	450	18.7	441	750
Crystal	407	20.5	435	740
A12769-1	390	20.5	417	709
Kennebec	395	19.9	411	699
Pioneer	376	20.9	410	697
Lemhi	358	21.9	408	694
TXA218-2	408	18.5	396	673
Rus Burbank	358	20.5	383	651
A74708-9	360	20.3	382	649
B6987-184	260	24.1	325	553
210-2	282	19.9	293	498
Rus Burbank 307	278	20.1	292	496
LSD (.05)	57	0.8		

1/ - 2/ See footnotes below Washington Table 2.

Cost of production estimated at $800/A, if grown for ethanol.

Idaho Table 8. Trials in southcentral and southwest Idaho of potato lines that might be considered for use as biomass for ethanol production - 1980.

Line	Cwt/A	% Solids	Gal Eth/A 1/	$ Value 2/
		Southwest Idaho		
A503-42	874	22.9	1040	$ 1768
Lemhi	757	24.0	939	1596
Butte	710	25.4	930	1581
Bintje	945	18.8	926	1574
Wn C 612-13	633	24.9	810	1377
A68113-4	684	22.7	807	1372
A67142-1	626	21.6	701	1192
Atlantic	586	21.6	656	1115
Rus Burbank	481	22.9	572	972
		Kimberly, Idaho		
Kennebec	645	22.9	768	1306
B6987-200	624	21.6	699	1188
A68113-4	632	19.7	651	1107
Lemhi	509	21.4	565	961
A67142-1	518	19.2	518	881
A7269-7	488	20.3	517	879
A69327-5	490	19.7	505	859
Atlantic	437	21.6	489	831
A68710-5	463	20.1	486	826
Bintje	490	18.8	480	816
Wn C 612-13	443	20.7	478	813
Rus Burbank	461	19.4	466	792
Crystal	447	18.8	438	745
A503-42	447	18.6	434	738

1/ - 2/ See footnotes below Washington Table 2.

Cost of production estimated at $900/A., if grown for ethanol.

Maine Table 9. Trial of Potential ethanol lines on Aroostook Farm - 1980 (120 days growing season).

Line	Tubers				Tops		Total	
	Cwt/A	S.G.	% Carbo [1/]	Gal Eth/A [2/]	Cwt/A	Gal Eth/A [3/]	Gal Eth/A [4/]	Value [5/]
A503-42	501	1.087	17.7	576	334	107	683	$ 1161
Denali	424	1.098	19.4	534	248	80	614	1044
Red Pontiac	533	1.071	15.3	528	236	76	604	1027
Lemhi	435	1.081	16.8	465	352	113	578	983
Crystal	470	1.073	15.6	475	316	102	577	981
Kennebec	456	1.076	16.1	474	274	88	562	955
Atlantic	426	1.090	18.2	503	134	43	546	928
Wn C 612-13	384	1.090	18.2	453	264	85	538	915
B6987-184	351	1.095	18.9	432	224	72	504	857
Norchip	422	1.081	16.8	452	148	48	500	850
Rus Burbank	391	1.080	16.7	422	222	71	493	838
Rideau	371	1.075	15.9	382	274	88	470	799
B7583-6	347	1.082	17.0	382	254	82	464	789
Superior	414	1.072	15.5	414	132	43	457	777
B6987-201	327	1.094	18.8	399	158	51	450	765
Trent	300	1.090	18.2	354	196	63	417	709
G6880-1	308	1.084	17.3	345	100	32	377	641
B6987-43	265	1.072	15.5	265	84	26	291	495

1/ - 5/ See footnotes below Washington Table 2. Cost of production estimated at $600/A, if grown for ethanol.

Maine Table 10. Lines from a second trial on Aroostook Farm - some potential ethanol lines (120 days growing season).

Line	Tubers				Tops		Total	
	Cwt/A	S.G.	% Carbo [1/]	Gal Eth/A [2/]	Cwt/A	Gal Eth/A [3/]	Gal Eth/A [4/]	Value [5/]
Atlantic	438	1.092	18.5	526	168	54	580	$ 986
Bounty	498	1.074	15.8	508	170	54	562	955
NBS1-3	457	1.071	15.3	452	300	97	549	933
210.2	414	1.080	16.7	447	142	46	493	838
12.72-2	405	1.071	15.3	401	220	71	472	802
A129.69-1	364	1.074	15.8	371	236	76	447	760
Superior	386	1.074	15.8	394	84	27	421	716

1/ - 5/ See footnotes below Washington Table 2.

Cost of production estimated at $600/A, if grown for ethanol.

North Dakota Table 11. Trial of potential ethanol lines grown at Grand Forks, planted May 12 and 19/80, harvested Sept. 22 and 23/80 (133 days).

Line	Cwt/A	S.G.	% Carbo 1/	Gal Eth/A 2/	$ Value 3/
Bounty	266	1.079	16.5	285	$ 485
A503-42	238	1.084	17.3	267	454
Neb. 210-2	222	1.074	15.8	226	384
Wn C 612-13	189	1.090	18.2	223	379
Neb. 12.72-2	237	1.064	14.3	218	371
Red Pontiac	216	1.069	15.0	210	357
TND22-2	178	1.088	17.9	206	350
ND9403-16R	190	1.076	16.1	198	337
ND55-7	173	1.085	17.4	195	331
Lemhi	171	1.085	17.4	193	328
Neb. A129.69-1	193	1.072	15.5	193	328
Kennebec	186	1.073	15.6	188	320
Crystal	168	1.083	17.1	186	316
ND329-4R	182	1.081	15.2	178	303
Neb. 51-3	166	1.063	14.1	151	257
ND372-2R	132	1.085	17.4	149	253
ND258-1	109	1.084	17.3	122	207
ND206-1R	118	1.074	15.6	120	204
Rus Burbank 307	106	1.084	17.3	118	201
ND612-9	95	1.082	17.0	105	179
B6987-201	70	1.088	17.9	81	138

1/ - 3/ See footnotes below Washington Table 2.

Cost of production estimated at $500/A, if grown for ethanol.

ALABAMA

J. L. Turner and Harrison Bryce - Main Station
E. L. Carden, R. N. McDaniel, Frank B. Selman and
Frank E. Garrett (Retired) - Gulf Coast Substation
Marlin H. Hollingsworth - North Alabama Horticulture Substation
John Eason and Marvin E. Ruf - Sand Mountain Substation

Potato Variety Trials, Gulf Coast Substation Fairhope and Sand Mountain Substation Crossville, Alabama

Experimental Procedure. Seed potatoes were obtained from Frito-Lay Company, Baldwin County, Alabama, Minnesota, North Dakota, Starks Farms and the University of Wisconsin for the 1980 trials. Sixteen named varieties and 12 numbered selections were grown this year for yield data and specific gravity. Each entry was replicated four times in a randomized block design. One row plots were 25 feet by 38 inches at Fairhope and 20 feet by 38 inches at Crossville. Seedpieces were cut to approximately one and one-half ounces each and dusted with Orthocide 10 Dust at 3/4 pounds to 100 pounds of cut seed. Seedpieces were stored at 55° F for approximately two weeks and planted February 20 at Fairhope and April 7 at Crossville. Seedpieces were planted at Fairhope with a hand operated planter and at Crossville by hand. Seedpieces were spaced 12 inches in the drill. Plots were harvested June 3 at Fairhope and July 15 at Crossville.

Results. At Fairhope very good stands were recorded for all entries. Frito-Lay 1152 was the highest yielding white entry and one source of Red La Soda was the highest yielding red entry. Red La Soda remains the most productive red skin variety for Alabama. Frito-Lay entries FL 1280, FL 1283, and FL 1221 also produced good yields of size A potatoes. Wisconsin 718 produced the lowest yield of size B potatoes. However, the per cent of size A yield was no better than several of the other entries. Wisconsin 807-R produced the highest yield of size B and the lowest per cent of size A potatoes. Wisconsin 760 produced the highest specific gravity, 1.082. Atlantic produced the next highest specific gravity, 1.078.

At Crossville, an early March planting was delayed due to excessive rain that prevented land preparation. Variety and breeding line yields were very variable. Day temperatures above 105° F were recorded on several occasions during June and July. Severe drought conditions also contributed to the adverse growing conditions. Yields and size distribution for the Crossville trial reflect the adverse weather conditions that prevailed throughout the test. Atlantic produced the highest yield of the white entries and Red La Soda from one source produced the highest yield of the red entries. Wisconsin 807-R was the next highest yielding red entry. Atlantic and Wisconsin 760 produced the highest specific gravity of all the entries.

Alabama Table 1. Potato Variety Trial, Fairhope, 1980[1/]

Variety	Source	Marketable yield/acre			Size A of total	Specific gravity[3/]	Stand at harvest
		Total	Size A[2/]	Size B			
		Cwt.	Cwt.	Cwt.	%		%
FL 1152	Frito Lay	251	234	17	93	1.063	100
FL 1280	Frito Lay	249	228	21	92	.067	100
FL 1283	Frito Lay	248	234	9	96	.070	95
Wis 728	U. Wisconsin, Rhinelander	248	239	9	96	.065	100
Red La Soda.....	Gilleshammer Bros.- ND	248	232	16	94	.062	100
FL 1221	Frito Lay	247	231	16	94	.065	95
Wis 760	U. Wisconsin, Rhinelander	243	227	16	93	.082	100
FL 1291	Frito Lay	238	219	19	94	.071	100
Atlantic	Starks Farms	234	221	13	94	.078	100
FL 795	Frito Lay	230	220	10	96	.068	100
Belchip	Starks Farms	227	212	15	93	.071	100
FL 657	Frito Lay	217	201	16	93	.063	95
Wis 806-R	U. Wisconsin, Rhinelander	214	193	21	90	.060	90
Red La Soda	Starks Farms	213	199	14	93	.060	100
FL 96	Frito Lay	211	185	26	88	.071	90
Wis 807-R	U. Wisconsin, Rhinelander	204	159	45	78	.065	90
Sebago	Starks Farms	203	183	20	90	.061	100
Red La Soda	Clark Farming Co. - ND	198	182	16	92	.062	100
La Chipper	Starks Farms	192	179	13	93	.065	95
Wis 774-R	U. Wisconsin, Rhinelander	192	165	27	86	.058	90
FL 162	Frito Lay	192	173	19	90	.064	100
Wis 718	U. Wisconsin, Rhinelander	191	183	8	96	.062	95
Wis 726	U. Wisconsin, Rhinelander	190	175	15	92	.067	95
Wis 723	U. Wisconsin, Rhinelander	168	154	14	92	.070	95
Wis 748	U. Wisconsin, Rhinelander	162	140	22	86	.071	90
Wis 795	U. Wisconsin, Rhinelander	161	139	22	86	.073	95
Superior	Starks Farms	153	132	21	86	.067	90
Norchip	Wes Holtman Potato Co. - MN	145	124	21	86	.068	100

Alabama Table 1. Continued

[1]Soil test: P = 150 (H); K = 128 (H); pH = 5.6.

[2]Size A = potatoes with 1-7/8 inches diameter and larger; Size B = potatoes with 1-1/2 to 1-7/8 inches diameter.

[3]Specific gravity was greater than 1.0 each variety.

Alabama Table 2. Potato Variety Trial, Crossville, 1980[1/]

Variety	Source	Marketable yield/acre			Size A of total	Specific gravity[3/]	Stand at harvest
		Total	Size A[2/]	Size B			
		Cwt.	Cwt.	Cwt.	%		%
Atlantic	Starks Farms	105	80	25	76	1.082	92
Red La Soda	Clark Farming Co. - ND	102	82	20	80	.058	99
Wis 807-R	U. Wisconsin, Rhinelander	95	81	14	85	.057	99
Wis 760	U. Wisconsin, Rhinelander	94	73	21	78	.082	97
FL 96	Frito Lay	93	70	23	75	.060	96
La Chipper	Starks Farms	92	65	27	71	.073	87
Red La Soda	Starks Farms	90	70	20	78	.059	95
FL 657	Frito Lay	88	69	19	78	.067	93
Superior	Starks Farms	87	69	18	79	.075	100
Norchip	Wes Holtman Potato Co. - MN	87	68	19	78	.071	97
Red La Soda	Gilleshammer Bros. - ND	80	63	17	79	.058	99
Wis 795	U. Wisconsin, Rhinelander	80	61	19	76	.071	96
Wis 806-R	U. Wisconsin, Rhinelander	77	51	26	66	.059	91
Wis 728	U. Wisconsin, Rhinelander	77	59	18	77	.072	93
Wis 726	U. Wisconsin, Rhinelander	74	56	18	76	.065	94
FL 1291	Frito Lay	72	47	25	65	.071	94
FL 1221	Frito Lay	71	54	17	76	.070	91
FL 795	Frito Lay	70	55	15	79	.071	88
Wis 723	U. Wisconsin, Rhinelander	70	47	23	67	.071	94
FL 1283	Frito Lay	63	52	11	83	.069	92
Wis 748	U. Wisconsin, Rhinelander	62	50	12	83	.072	77
FL 1152	Frito Lay	59	41	18	70	.058	94
Wis 718	U. Wisconsin, Rhinelander	58	42	16	72	.062	84
FL 162	Frito Lay	52	36	17	70	.064	93
Wis 774-R	U. Wisconsin, Rhinelander	50	42	8	84	.055	99
Belchip	Starks Farms	45	35	10	78	.061	82
Sebago	Starks Farms	44	28	16	64	.057	96
FL 1280	Frito Lay	38	28	10	74	.061	90

Alabama Table 2. Continued

[1]Soil test: P = 145 (VH); K = 128 (H); pH = 5.6

[2]Size A = potatoes with 1-7/8 inches diameter and larger; Size B = potatoes with 1-1/2 to 1-7/8 inches diameter.

[3]Specific gravity was greater than 1.0 for each variety.

ALASKA

Curtis H. Dearborn

Potato Research

Our growing season was the third coldest and the second wettest in 30 years. Rhizoctonia girdle of stem, stolon and buds was severe and where plant stands were low Rhizoctonia was the cause. Seedpiece rot seldom occurs in seed that is clean and handled properly, although there are clones that decay rapidly instead of suberizing following cutting unless favorable suberizing conditions are provided.

Clone B8934-2AK recently named Highlat Russet, produced well in the Arctic compared with 24 other potatoes in trial. Dr. Raymon Webb and I have exchanged selected seedlings from this cross to learn if one of the two selected on the East Coast, B8934-4 and B8934-5, might have been originally from the same true seed. I concluded that my selection in Alaska, Highlat, is different from either of his and better at my latitude. Clone B8934-4 from five tuber units produced 64 tubers totaling 15.0 lbs. at 1.079 sp. gr., whereas B8934-5 from five tuber units produced 109 tubers weighing 29.4 lbs. at 1.073 sp. gr. The bud end of the latter failed to russet. Twenty two tubers of B8934-4 weighing 7.4 lbs. were spongy when hand dug from plants whose foliage was lush. Highlat produced 83 tubers weighing 22.6 lbs. at 1.086 sp. gr. and did not show sponginess.

In this very wet season four clones among 36 in the Late Harvest trial produced at the rate of 300 cwt per acre total yield with specific gravity ranging from 1.100 to 1.103. Alcohol from Alaskan potato production might be competitive with alcohol from grain in other regions. Nipigon ranked first in yield of No. 1 tubers in Early Harvest and second in Late Harvest among 36 clones in trial. Its specific gravity was 1.073 and 1.080 respectively compared with the average of each study 1.081 and 1.089. NY 61 was third in yield in the Earlies and 27th in the 'Lates' with low specific gravity in both, 1.077 and 1.081. Allagash was quite acceptable. Pembena Chipper made the lightest chip of any of the 36 clones.

Selecting potato seedlings for deep tuberizing clones that do not require hilling to protect the tubers from greening was continued. Thirty seven of the 97 from 1979 selections were essentially free from greening. Six families were represented. Preliminary data indicate that deep tuberization may be inherited in a one to three ratio although my population may not be large enough to be accurate.

It appears that the stimulus or stimuli causing geotropic growth of a stolon that is growing horizontally is of very short duration and not associated with stolon length. This polarity change is a response to the environment to which the top is exposed and is reversible.

CALIFORNIA

R. E. Voss, P. W. Bosland, E. S. Sarreal[1/]

Potato Seedling and Varietal Evaluation - 1980

The 1980 potato project in California was not affected by the drought that damaged much of the potato crop in many areas of the United States - and good yields were obtained. Plantings of first year tubers, five hill, 12 hill, and two replications of 20 hill plots were planted at the USDA Cotton Research Station at Shafter in Kern County and the Tulelake Field Station in Siskiyou-Modoc Counties. At six locations: Riverside, Santa Maria, Shafter, Tulelake, Butte Valley, and Eureka replicated yield trials were conducted. (Tables 1 and 2.)

The first year tubers were obtained from Dr. J. Pavek (Idaho) and Dr. R. Johansen (North Dakota). From Idaho 10,715 seedling tubers representing 58 families and from North Dakota 10,037 seedling tubers representing 53 families were received. The seedling tubers were planted both at Shafter and Tulelake.

Of the 20,752 seedling tubers evaluated, 481 lines were selected for further evaluation and will be planted in five-hill plots at Shafter and Tulelake in 1981. In the five-hill plot tests, 134 of 507 lines and 68 of 342 lines were retained for further evaluation in 12-hill plots at Shafter and Tulelake, respectively. The 12-hill observational plots using the same selection criterion had 32 of 47 lines and 26 of 55 lines saved from Shafter and Tulelake, respectively. These 12 hill observational lines will be planted in the 2 X 20 plots in 1981.

The two replications of 20 hill plots grown at Shafter and Tulelake were evaluated for yield, specific gravity, chip color, and general tuber rating. Twenty-seven clones were tested at both Shafter and Tulelake. The summary of this data appears in Tables 3 and 4.

The replicated yield trials at Shafter and Tulelake had 52 and 54 lines, respectively. They, as the 2 X 20, were evaluated for yield, specific gravity, chip color, and general tuber rating. These entries are listed in Tables 1 and 2.

1/ In 1980 personnel changes both temporary and permanent occurred with the California potato project. A special thanks to Dr. Robert Johansen for his valuable contribution to the project and to the many farm advisors, staff assistants, and secretaries who helped maintain the excellence of the project.

California Table 1. Yield and Quality Measurements of Replicated Yield Trials at Shafter, 1980

Variety	Source	Yield, Cwt/A						Spec. Grav. 1.0-- [1]	Tuber Rating [2]	Chip Color [3]
		Total	No. 1's >12 oz	No. 1's 4-12 oz	2's & CULLS	B's	% #1's			
				PART A. Russets						
A74265-2	Delta	465	35	430	5	10	96	93	3.4	1.0
BC8524-3	Colo	450	30	420	5	25	92	87	3.8	1.6
AD7267-1	Delta	450	50	400	10	15	94	79	4.3	1.0
Norgold Russet "M"	Delta	440	30	410	5	15	96	87	4.0	
AD74135-1	Delta	430	20	410	10	15	95	87	3.5	1.0
A66122-3	Butte V.	430	40	390	15	15	97	92	3.8	1.0
A74595-11	Delta	400	10	390	0	25	93	97	2.6	1.0
AD7377-1	Delta	400	15	385	10	0	98	82	4.0	1.0
AD74393-3	Delta	400	45	355	5	15	96	85	3.1	1.0
Lemhi	Delta	375	35	340	5	20	95	92	3.6	1.0
A74133-1	Delta	365	20	345	0	15	97	89	3.6	1.0
NDD358-9	Delta	350	25	325	10	15	92	95	2.9	1.0
AD74103-3	Delta	340	15	325	5	15	94	93	3.8	1.0
AD7267-3	Delta	340	5	335	0	20	93	91	2.8	1.2
A74104-18	Delta	330	0	330	15	25	91	83	3.1	1.0
Russet Burbank	Delta	325	10	315	45	10	86	95	3.1	1.0
Butte	Butte V.	310	0	310	15	75	52	93	2.4	1.0
A70365-27	Delta	305	50	255	0	10	95	98	4.0	1.0
Centennial	Delta	295	5	290	0	20	92	86	3.1	1.0
WC567-1	Delta	270	5	265	0	20	92	85	3.4	2.5
A68599-1	Delta	265	0	265	0	15	93	90	3.3	1.0
BC8370-4	Delta	260	0	260	0	50	84	85	3.1	1.3
WD641-10	Delta	225	5	220	5	5	94	89	3.8	1.0
A74139-3	Delta	215	0	215	30	25	81	91	2.4	1.0
NDD252-8	Delta	200	20	180	75	10	69	94	1.5	
WD630-4	Delta	140	0	140	0	25	82	91	1.8	1.0
				PART B. Whites & Chippers						
ND8891-3 (Crystal)	Delta	555	50	505	80	10	85	86	3.8	1.0
NDD9474-6	Delta	555	65	490	35	10	92	87	4.0	
BC9020-7	Colo	520	10	510	45	20	90	93	3.8	1.0
Belchip	Delta	500	50	450	30	0	94	98	3.8	1.0
AD74548-5	Delta	495	30	465	20	25	92	88	4.0	1.0
BC9071-6	Colo	470	5	465	20	15	94	79	4.0	1.0

California Table 1. Yield and Quality Measurements of Replicated Yield Trials at Shafter, 1980 - Page 2

Variety	Source	No. 1's Total	No. 1's >12 oz	No. 1's 4-12 oz	2's & CULLS	B's	% #1's	Spec. Grav. 1.0-- [1]	Tuber Rating [2]	Chip Color [3]
				PART B. Whites & Chippers Continued						
A74124-3	Delta	460	115	345	75	15	85	90	3.5	2.5
WC672-9	Delta	460	20	440	70	5	86	99	3.3	1.0
ND277-2	Delta	450	45	405	15	0	97	85	4.0	1.0
Kennebec	Delta	445	95	350	70	10	85	93	3.9	1.5
Atlantic	Delta	440	20	420	35	20	91	98	4.0	1.0
AK28-8	Delta	410	25	385	30	20	90	93	3.9	1.0
NDD237-4	Delta	395	35	360	35	10	90	84	3.1	1.0
NDD110-4	Delta	395	10	385	20	20	93	85	3.4	1.0
White Rose	Delta	390	20	370	25	10	93	89	3.4	2.5
B6987-201	Ore	385	25	360	40	20	87	97	3.3	1.0
WC672-2	Delta	375	55	320	5	0	93	96	3.9	1.0
AD7386-1	Delta	370	100	270	25	15	90	87	3.9	1.2
A74133-1	Delta	365	20	345	0	15	97	89	3.6	1.0
WC521-12	Delta	355	90	265	25	10	92	101	4.0	1.2
NDD245-5	Delta	355	10	345	60	5	85	92	3.1	1.0
A74127-2	Delta	350	30	320	40	10	87	92	3.5	1.0
B6987-184	Delta	340	25	315	40	20	86	100	3.0	1.0
NDD47-1	Delta	255	40	215	10	35	85	87	3.4	1.0
				PART C. Reds						
Red La Soda	Delta	465	75	390	30	10	93	79	3.0	1.0
AC67560-1	Delta	300	20	280	0	15	95	82	3.8	2.3
LSD 5%		20	9	18	7	4				

[1] Specific gravity determined by potato hydrometer

[2] Tuber rating: 5 = excellent, 4 = good, 3 = acceptable, 2 = unacceptable, 1 = poor

[3] Chip color determined by color chart where 1 = lightest and 5 = darkest

CALIFORNIA TABLE 2. Yield and Quality Measurements of Replicated Yield Trials at Tulelake, 1980

Variety	Source	Yield, Cwt/A					% #1's	% Stand	Spec. Grav. 1.0-- [1/]	Tuber Rating [2/]	Chip Color [3/]
		Total	No. 1's >12 oz	No. 1's 4-12 oz	2's & CULLS	B's					
					PART A - Russets						
A74133-1	Delta	570	165	405	25	35	90	95	71	3.8	3.2
Lemhi	Ore	560	135	425	35	50	87	87	83	4.0	2.3
AD7267-1	Ore	555	185	370	50	40	86	91	70	4.3	4.2
AD7377-1	Ore	530	90	440	45	30	88	81	64	4.5	3.2
AD7377-1	Delta	525	105	420	30	35	89	88	65	4.3	2.5
Nor. Rus. "M"	Delta	520	95	435	60	25	86	91	70	3.0	3.0
A68599-1	Delta	510	85	435	5	20	95	81	78	3.5	2.3
A74595-11	Delta	490	110	380	65	30	84	96	78	3.5	4.0
AD7267-3	Delta	485	80	405	30	45	87	92	80	4.0	2.8
Rus. Bur.	Ore	475	60	415	45	95	77	98	83	2.8	2.7
AD74103-3	Delta	470	125	345	60	45	82	95	78	2.5	3.2
A74265-2	Delta	470	115	355	70	40	81	87	76	4.0	3.5
AD74135-1	Delta	460	90	370	75	55	78	92	79	4.0	2.8
AD7267-1	Delta	450	140	310	35	50	84	88	68	3.8	3.7
B6987-201	Ore	430	40	390	15	45	88	74	93	3.0	1.8
AD74393-3	Delta	420	45	375	25	45	86	91	66	2.8	3.0
BC8370-4	Delta	420	30	390	20	55	85	94	83	3.8	2.7
A66122-3	Delta	405	65	340	50	35	83	86	78	3.0	3.3
Centennial	Delta	400	65	335	25	35	87	87	75	4.0	3.0
Lemhi	Delta	395	80	315	45	40	82	94	80	3.0	2.3
A74139-3	Delta	390	90	300	70	35	79	94	79	3.3	2.0
WD641-10	Delta	385	90	295	40	30	85	93	81	3.8	1.7
Butte	Delta	380	50	330	20	60	83	86	79	2.8	2.7
BC8524-3	Colo	375	45	330	65	145	64	98	72	2.8	3.3
NDD358-9	Delta	370	30	340	20	75	80	83	77	2.8	2.3
WC567-1	Delta	345	55	290	110	55	68	93	70	2.5	3.8
A70365-27	Delta	335	60	275	30	75	76	84	74	3.0	1.8
NDD252-8	Delta	330	60	270	40	55	78	85	79	3.0	3.7
WD630-4	Delta	315	60	255	30	30	84	99	81	3.3	1.5
Rus. Bur.	Delta	310	40	270	90	55	68	99	82	2.8	2.3
WD641-10	Ore	300	90	210	30	35	82	72	79	4.0	1.7

CALIFORNIA TABLE 2 CONTINUED. Yield and Quality Measurements of Replicated Yield Trials at Tulelake, 1980

Variety	Source	Yield, Cwt/A Total	No. 1's >12 oz	No. 1's 4-12 oz	2's & CULLS	B's	% #1's	% Stand	Spec. Grav. 1.0-- [1/]	Tuber Rating [2/]	Chip Color [3/]
				PART B - Whites							
Atlantic	Ore	680	70	610	25	45	91	97	88	3.3	2.5
BC9020-7	Colo	605	120	485	50	50	86	99	80	3.8	1.3
WC672-9	Delta	600	70	530	35	40	89	94	95	3.5	1.8
ND8891-3 (Crystal)	Delta	570	170	400	105	35	80	94	75	3.7	2.3
BC9071-6	Colo	550	90	460	20	25	92	94	84	4.0	1.7
Kennebec	Delta	540	320	220	150	20	76	87	68	3.0	.8
Belchip	Delta	540	100	440	40	25	89	92	89	3.3	1.0
Atlantic	Delta	540	60	480	15	45	90	89	88	4.0	2.5
ND9474-6	Delta	530	80	450	35	30	89	93	70	3.5	2.3
B6987-184	Delta	505	80	425	20	50	88	83	93	3.3	1.2
A74124-3	Delta	495	90	405	80	50	79	93	76	3.3	3.5
NDD110-4	Delta	495	95	400	15	45	89	93	73	3.8	1.8
AK 28-8	Delta	465	60	405	20	45	88	96	86	3.2	1.8
A74104-18	Delta	460	110	350	30	40	87	91	73	3.3	2.7
NDD277-2	Delta	440	120	320	50	15	87	93	81	4.0	.8
WC672-2	Delta	440	135	305	60	20	85	71	77	3.8	.8
WC521-12	Ore	440	110	330	30	25	89	76	89	3.3	2.3
AD74548-5	Delta	425	55	370	30	65	82	94	76	3.5	3.2
WC521-12	Delta	420	145	275	30	30	88	83	94	3.0	1.8
A74127-2	Delta	415	60	355	30	55	83	93	81	3.0	1.7
WC612-13	Delta	410	50	360	30	40	85	86	88	3.0	2.3
NDD245-5	Delta	400	30	370	45	35	83	96	81	3.8	1.3
AD7386-1	Delta	370	165	205	100	50	71	84	72	4.0	3.2
NDD237-4	Delta	345	70	275	55	20	82	92	79	3.0	1.8
White Rose	Delta	340	115	225	130	30	68	95	69	2.5	2.2
NDD47-1	Delta	290	40	250	40	45	77	94	66	3.3	2.8
				PART C - Reds							
Red LaSoda	Delta	605	200	405	110	30	81	89	71	3.5	3.0
AC67560-1	Ore	470	90	380	60	20	85	88	74	3.2	3.2
AC67560-1	Delta	455	145	310	60	20	85	84	64	3.3	3.0
LSD 5%		28	20	23	8	10					

CALIFORNIA TABLE 2 CONTINUED. Yield and Quality Measurements of Replicated Yield Trials at Tulelake, 1980

1/ Specific gravity determined by potato hydrometer

2/ Tuber Rating: 5 = excellent, 4 = good, 3 = acceptable, 2 = unacceptable, 1 = poor

3/ Chip color determined by color chart where 1=lightest and 5=darkest

CALIFORNIA TABLE 3. Yield and Quality Measurements of 2 X 20 at Shafter, 1981

Variety	Source	Yield, Cwt/A					% #1's	% Stand	Spec. Grav. 1.0-- [1/]	Tuber Rating [2/]	Chip Color [3/]
		Total	No. 1's >12 oz	No. 1's 4-12 oz	2's & CULLS	B's					
PART A - Russets											
A74543-6	Delta	445	55	390	20	70	83	98	92	3.0	1.0
NDD393-9	Delta	430	130	300	5	0	98	88	84	3.8	1.0
NDD392-6	Delta	405	60	345	5	30	93	93	85	3.0	1.0
NDD443-4	Delta	390	50	340	40	10	91	90	90	3.0	1.0
AD74574-1	Delta	365	45	320	5	20	95	93	93	4.0	1.0
Lemhi	Delta	360	0	360	15	15	92	65	93	3.0	1.0
AD74197-1	Delta	355	40	315	20	5	92	68	92	4.0	1.0
NDD452-1	Delta	345	55	290	0	5	99	100	82	3.3	1.0
ND274-6	Delta	340	0	340	0	5	96	83		3.0	
AD74575-1	Delta	320	25	295	0	30	92	68	93	3.5	1.0
Centennial	Delta	295	10	285	0	20	94	75	92	3.5	1.3
ND333-1	Delta	285	85	200	5	10	95	88	92	2.3	1.0
ND694-1A	Delta	255	25	230	10	5	94	50	84	3.0	1.3
NDD639-6	Delta	245	15	230	5	5	96	95	89	3.0	1.0
NDD143-1	Delta	225	0	225	0	25	90	93	89	2.8	1.0
WD630-2	Delta	140	0	140	0	25	80	5	85	2.0	1.0
PART B - Whites											
Kennebec	Delta	480	145	335	40	5	91	80	90	3.8	1.0
ND258-1	Delta	440	55	385	0	10	98	98	90	4.0	1.0
ND227-1	Delta	435	10	425	25	35	88	100	92	2.8	1.0
White Rose	Delta	400	30	370	15	15	93	78	85	3.5	1.0
ND258-3	Delta	390	30	360	5	15	95	98	92	3.5	1.0
ND337-4	Delta	385	15	370	30	15	88	85	94	3.0	1.0
ND278-2	Delta	370	10	360	10	5	96	85	90	3.0	1.0
NDD588-1	Delta	355	90	265	5	5	97	80	82	3.8	1.0
ND278-3	Delta	305	5	300	0	5	98	83	93	3.0	1.0
ND362-3	Delta	300	0	300	15	10	94	90	93	3.0	1.0
ND89-9	Delta	235	20	215	45	5	83	35	88	3.5	1.0
LSD 5%			28	65	11						

1/ Specific gravity determined by potato hydrometer

2/ Tuber Rating: 5 = excellent, 4 = good, 3 = acceptable, 2 = unacceptable, 1 = poor

3/ Chip color determined by color chart where 1 = lightest, and 5 = darkest

California Table 4. Yield and Quality Measurements of 2 X 20 at Tulelake, 1981

Variety	Source	Yield, Cwt/A					% #1's	% Stand	Spec. Grav. 1.0-- [1]	Tuber Rating [2]	Chip Color [3]
		Total	No. 1's >12 oz	No. 1's 4-12 oz	2's & CULLS	B's					
					PART A. Russets						
Russet Burbank	Delta	245	40	205	32	21	82	100	86	4.00	2.3
Lemhi	Delta	236	72	163	8	19	90	100	87.5	3.75	.8
ND274-6	Delta	196	24	172	2	17	91	98	78	4.00	2.2
NDD143-1	Delta	192	47	145	12	14	88	100	77.5	4.00	1.7
AD74574-1	Delta	192	40	152	8	12	91	80	75.5	3.50	2.7
AD74197-1	Delta	187	33	154	22	24	80	95	72.5	3.75	1.8
WD694-1A	Delta	171	67	104	22	15	82	100	76	3.25	2.5
NDD452-1	Delta	169	72	97	1	19	89	98	75.5	3.50	2.7
Centennial	Delta	150	5	145	2	19	88	90	75.5	3.00	3.3
AD74575-1	Delta	143	27	116	11	22	81	88	73	3.25	2.0
AND7422-1	Delta	138	18	120	8	34	77	90	82	3.5	2.0
A74543-6	Delta	130	62	68	43	17	68	90	87	3.5	2.2
NDD443-4	Delta	128	34	94	19	7	83	68	72.5	3.00	1.5
ND392-6	Delta	125	43	82	90	18	54	98	79	2.75	3.8
WD630-2	Delta	123	35	88	16	15	80	95	86.5	3.25	3.0
NDD639-6	Delta	91	24	67	14	6	82	68	73.5	3.00	--
					PART B. Whites						
ND258-1	Delta	263	100	163	24	22	85	100	73.0	4.00	1.8
ND362-3	Delta	251	34	217	31	15	85	95	87	4.00	2.8
Kennebec	Delta	239	121	118	60	15	76	100	78.5	3.25	2.2
ND278-3	Delta	236	64	172	19	14	88	100	85.0	4.00	2.0
ND337-4	Delta	236	72	163	8	19	90	100	87.5	3.75	1.7
ND89-9	Delta	200	47	153	19	15	86	100	77	4.00	1.7
White Rose	Delta	196	103	89	55	18	73	98	82	3.00	--
ND278-2	Delta	178	29	149	21	10	85	90	77	3.50	1.2
ND227-1	Delta	177	30	147	27	21	79	95	80.5	3.75	2.0
ND229-1	Delta	144	11	133	6	15	87	95	81.5	3.75	1.0
NDD588-1	Delta	130	62	68	20	9	82	90	73	3.25	2.3
LSD 5%		N.S.	24	41	6	5					

[1] Specific gravity determined by potato hydrometer

[2] Tuber rating: 5 = excellent, 4 = good, 3 = acceptable, 2 = unacceptable, 1 = poor

[3] Chip color determined by color chart where 1 = lightest and 5 = darkest

COLORADO

J. A. Twomey, D. G. Holm, and M. Workman

Potato Seedling and Varietal Evaluation

Seedling Program. A breeding program was started in 1979 to supplement the seedling program. Twenty-one parental clones were selected for crossing in 1980 and seeds from 231 crosses were obtained. Seeds produced in 1979 from 29 families were grown in the greenhouse. Approximately 8,000 seedling tubers were produced and the surplus is being distributed to other programs.

Approximately 35,000 first-year seedlings were grown in the field in 1980. Three hundred seventy were selected for increase and evaluation. Twenty-two second-year and 28 advanced seedlings will be tested in 1981.

Two processing types, WC672-2 and WC521-12 have shown promise and are being evaluated in the WRCC-27 variety trials. Both have high dry matter content and good yields. Clone AC67560-1, a red potato, has been tested in the West and will probably be released and named in 1981. A new russet, BC9289-1, has looked extremely promising.

Eighteen clones were tested for chip color and dry matter and the results may be found in Colorado Table 1.

Colorado Table 1. Chip Color[1/] and Specific Gravity[2/] of Promising Advanced Seedlings at Harvest and After Storage[3/].

Seedling No.	At Harvest	3 Wks 65° F Post Harvest	10 Wks Storage @ 50° F	Warmed 2 Wks @ 70° F 10 Wks Storage @ 40° F	Warmed 2 Wks @ 70° F 10 Wks Storage @ 50° F	Specific Gravity
	Color	Color	Color	Color	Color	
AC711026-2	29.5	26.0	14.0	7.0	17.0	1.087
AC72665-1	33.0	28.5	17.0	10.0	23.5	1.084
BC9384-1	45.0	42.0	25.0	14.0	33.0	1.091
BC9600-3	35.0	35.5	19.0	6.0	28.0	1.081
BC9539-3	32.0	23.0	15.0	10.0	13.0	1.091
BC9566-7	36.0	24.0	14.0	10.0	19.0	1.086
BC9582-3	40.0	30.5	25.0	15.5	21.0	1.092
AC7508-2	30.0	41.0	30.0	12.0	30.0	1.085
BC9566-11	30.0	23.0	11.5	7.0	15.5	1.080
BC9546-1	40.0	32.0	23.0	13.0	23.0	1.092
BC9407-3	36.0	28.0	27.0	25.0	32.0	1.101
BC9020-7	40.0	39.0	28.0	9.0	25.0	1.089
BC9071-6	36.0	40.0	30.0	6.0	32.5	1.085
BC8524-3	29.5	17.0	9.0	3.0	11.0	1.075
WC521-12	44.0	41.0	26.0	22.0	33.0	1.109
WC612-13	33.0	32.5	21.0	17.5	29.0	1.098
WC672-2	40.5	41.5	32.0	20.0	38.0	1.095
Atlantic	30.0	37.0	30.0	19.0	32.0	1.100

[1/] Chip color determined with Photovolt reflectance meter. Color readings of 25 and above are acceptable.

[2/] Specific gravity determined by potato hydrometer and air/water method.

[3/] Chip samples from 10 wk storage @ 40° F were not included because all samples were extremely dark.

FLORIDA

J. R. Shumaker, D. P. Weingartner, James Watts, and Raymon E. Webb

Variety and Seedling Trials

Methods. Potato varieties and seedlings were tested for their adaptability and desirable horticultural characteristics at the Agricultural Research Center, Hastings, Florida. Clones were grown in either advanced (four replications) or intermediate (two replications) trials. Soil fumigation and planting and harvest dates are shown in procedures, Florida Tables 1-7. Commercial cultural practices were used on all tests. Yield and tuber appearance were taken at harvest. Tuber samples were shipped to Berwick, Pennsylvania, for specific gravity and chip color evaluation.

Advanced Yield and Quality Tests (Florida Tables 1-3). In three replicated trials grown under near excellent conditions Atlantic (USDA seed) and Belchip were superior to other clones in combining high yields and specific gravity with desirable tuber types and chip color. Varieties and seedlings grown from Maine (USDA) seed produced higher yields (Florida Table 2) than the same clones grown from North Carolina (NC) seed.

Intermediate Yield and Quality Tests (Florida Table 4). Seedlings which compared favorably with either Atlantic (standard processing type) or Superior (standard round white type) will be tested further in 1981.

Advanced and Intermediate Russet Tests (Florida Tables 5 and 6). Seedling B7583-6 was the most promising russet clone tested in 1980. Combining high yield, good tuber appearance, and high solids (Florida Table 5). Both B9140-7 and Centennial closely followed the yield response of B7583-6.

Advanced Red Test (Florida Table 7). Two seedlings, Wis 806R and Wis 774R, were superior to Red La Soda (north Florida's standard red cultivar) in tuber yields, appearance, and specific gravity. They will be grower tested in 1981.

Florida Table 1. Results from 24 clones selected for advanced yield and quality testing at Hastings, Florida -- 1980.

Clone	Yield (cwt/acre) US1A	Tuber appear-ance[1]	Chip color[2] Weeks after harvest 1	2	3	Mean	Specific gravity
B8433-4	421	2.8	4	5	5	4.7	1.056
PA9II-1	379	7.0	4	2	3	3.0	1.062
Atlantic	378	7.0	3	4	5	4.0	1.070
New Haig	370	7.0	3	3	4	3.3	1.062
Wis 738	365	6.5	2	5	5	4.0	1.060
High Plains	363	3.2	4	3	3	3.3	1.061
La Chipper	361	2.8	2	4	3	3.0	1.063
Wis 718	350	7.0	2	3	4	3.0	1.057
B8352-3	340	5.5	3	5	5	4.3	1.061
New Superior	334	6.8	5	5	4	4.7	1.062
Wis 723	329	4.5	2	2	3	2.3	1.068
Michimac	325	5.2	4	6	5	5.0	1.061
Crystal	324	5.5	5	6	6	5.7	1.063
Wis 710	317	7.8	3	5	5	4.3	1.054
Norchip	310	4.8	2	3	5	3.3	1.064
Michibone	295	5.5	4	5	5	4.7	1.058
Dakcip	295	2.5	2	3	2	2.3	1.058
B8798-20	289	8.2	2	2	2	2.0	1.066
Croatan	288	2.8	2	3	3	2.7	1.057
Wis 726	271	4.2	2	4	2	2.7	1.064
B6969-2	263	6.8	4	5	4	4.3	1.057
Superior	242	7.5	3	4	5	4.0	1.066
B8615-2	193	4.8	2	3	2	3.3	1.071
Denali	173	4.2	4	4	5	4.3	1.073
LSD (0.05)	66	1.6					
(0.01)	88	2.2					

[1] From 9.0 = most desirable to 0.0 = completely undesirable.

[2] Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row planting. Replications = 4. Plot = 20 hill units (20 ft.). Planted = 2/4-5/80. Harvested 5/27-29/80.

Florida Table 2. Results from 22 clones selected for advance yield and quality testing at Hastings, Florida -- 1980.

Clone	Yield (cwt/acre) US1A	Tuber appear-ance[1]	Chip color[2] Weeks after harvest 1	2	3	Mean	Specific gravity
Belchip	414	5.5	2	2	2	2.0	1.067
Atlantic USDA	366	6.0	2	5	3	3.3	1.071
Pungo USDA	353	4.8	5	5	6	5.3	1.065
Sebago USDA	350	6.8	3	5	5	4.3	1.059
B8091-8	312	7.5	2	3	3	2.6	1.064
Sebago NC	308	7.5	3	5	4	4.0	1.060
B8907-4	307	6.8	3	3	3	3.0	1.062
B8724-2	305	6.5	2	4	5	3.7	1.067
B9067-6	301	6.8	4	6	6	4.7	1.064
New Superior	268	7.8	3	3	5	3.7	1.064
B6987-184	259	6.2	2	3	2	2.3	1.073
B9071-1	256	8.0	1	3	3	2.3	1.066
B6969-2 USDA	252	8.0	5	5	3	4.3	1.062
B6969-2 NC	233	9.0	3	3	2	2.7	1.060
B8599-42	229	7.2	3	3	3	3.0	1.058
B8799-13	222	6.5	4	2	3	3.0	1.075
Pungo NC	220	4.8	5	5	5	5.0	1.059
Atlantic NC	187	5.8	3	3	5	3.7	1.071
B8285-3	173	5.2	6	6	6	6.0	1.069
B9062-9	173	6.8	3	5	2	3.3	1.061
Superior USDA	154	8.5	5	5	3	4.3	1.069
Superior NC	119	7.0	3	4	5	4.0	1.066
LSD (0.05)	96	1.6					
(0.01)	127	2.2					

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row planting. Replications = 4. Plot = 20 hill units (20 ft.). Planted = 2/4-5/80. Harvested 5/27-29/80.

Florida Table 3. Results from 24 clones selected for advance yield and quality testing at Hastings, Florida -- 1980.

Clone	Yield (cwt/acre) US1A	Tuber appear-ance[1/]	Chip color[2/] Weeks after harvest 1	2	3	Mean	Specific gravity
Atlantic	401	7.8	2	3	3	2.7	1.070
B9224-6	394	7.2	5	5	4	4.7	1.061
B9127-1	390	7.5	6	6	3	5.0	1.059
B9127-6	381	8.5	2	5	3	3.7	1.068
Sebago	347	7.2	2	3	3	2.7	1.058
B9130-24	346	7.8	3	5	4	4.0	1.062
B9140-4	337	8.5	2	2	3	2.3	1.068
B9152-11	334	8.2	2	3	3	2.7	1.067
B9311-13	314	7.2	5	5	6	5.3	1.056
B9127-17	308	8.0	5	6	7	6.0	1.067
B9130-34	272	5.8	4	5	4	4.3	1.060
B9138-29	271	6.2	2	4	5	3.7	1.066
B9144-5	270	7.2	1	2	3	2.0	1.063
B9140-6	262	4.5	2	2	3	2.3	1.064
B9258-2	259	7.2	2	3	3	2.7	1.063
B9175-7	252	6.0	2	3	5	3.3	1.069
B9152-44	251	7.2	2	3	3	2.7	1.066
Superior	244	7.2	3	5	5	4.3	1.066
B9311-7	241	4.2	5	5	6	5.3	1.056
B9286-4	237	4.0	6	6	5	5.7	1.060
B9140-14	213	5.0	2	3	3	2.7	1.064
B9285-2	203	5.0	4	3	6	4.3	1.072
B9024-27	192	3.5	4	5	5	4.7	1.063
B8947-3	160	6.2	5	5	6	5.3	1.064
LSD (0.05)	68	1.9					
(0.01)	91	2.5					

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row planting. Replications = 4. Plot = 20 hill units (20 ft.). Planted = 2/4-5/80. Harvested 5/27-29/80.

Florida Table 4. Results from 84 clones selected for intermediate yield and quality testing at Hastings, Florida -- 1980.

Clone	Yield (cwt/acre) US1A	Tuber appear-ance[1]	Chip color[2] Weeks after harvest 1	2	3	Mean	Specific gravity
B8503-13	189	1.0					
B8514-8	271	7.0	2	2	3	2.3	1.063
B8618-5	103	5.0					
B8685-4	122	6.0					
B8706-7	218	5.0					
B8710-1	282	3.0					
B8740-1	88	6.5					
B8751-7	190	6.5					
B8966-3	202	3.5					
B9004-8	193	3.5					
B9016-16	246	7.0	4	3	5	4.0	1.052
B9016-20	287	4.0	5	6	5	5.3	1.054
B9018-12	348	7.5	2	2	2	2.0	1.066
B9020-10	389	2.5					
B9048-7	235	7.0	3	4	5	4.0	1.059
B9053-6	145	8.0					
B9071-4	249	6.5					
B9119-5	194	3.5					
B9140-2	142	4.0					
B9140-17	154	5.5					
B9140-32	198	6.0					
B9142-4	352	6.5	5	4	4	4.3	1.058
B9155-12	166	4.0	3	5	6	4.7	1.059
B9172-11	341	3.5	2	2	2	2.0	1.065
B9192-1	235	5.5	1	2	5	2.7	1.062
B9332-3	190	7.0	4	4	3	3.7	1.070
B9333-21	200	8.5	6	6	7	6.3	1.058
B9333-24	253	2.5					
B9335-5	334	7.0	3	4	2	3.0	1.057
B9335-7	240	8.5	3	5	6	4.7	1.063
B9335-16	198	8.5	2	3	3	2.7	1.064
B9335-17	374	8.5	2	5	5	4.0	1.068
B9335-19	176	6.5					
B9335-20	252	6.5					
B9335-24	203	7.5	4	5	5	4.7	1.061
B9335-30	254	6.0					
B9335-34	209	7.0					
B9335-35	284	7.0	1	3	3	2.3	1.073
B9335-36	403	6.5	2	5	6	4.3	1.061
B9335-49	321	8.0	5	5	6	5.3	1.056
B9335-60	177	7.0					
B9336-6	305	7.5	6	6	7	6.7	1.068
B9336-10	235	5.5					
B9336-11	322	5.0	3	5	7	5.0	1.060
B9336-15	251	5.5					

Florida Table 4. Continued.

Clone	Yield (cwt/acre) US1A	Tuber appear-ance[1]	Chip color[2] Weeks after harvest 1	2	3	Mean	Specific gravity
B9336-22	225	4.5					
B9336-24	301	3.5	3	5	4	4.0	1.068
B9340-7	213	7.5	2	3	3	2.7	1.069
B9341-6	264	7.0	5	5	4	4.7	1.060
B9344-5	327	6.5	3	2	2	2.3	1.071
B9344-10	206	3.5					
B9344-15	247	5.5	2	2	3	2.3	1.074
B9384-6	409	6.0	2	5	4	3.7	1.064
B9384-13	269	7.5	4	3	4	3.7	1.064
B9409-1	395	6.0	2	5	5	4.0	1.061
B9423-4	468	5.5					
B9439-4	333	5.0	3	3	5	3.7	1.067
B9445-2	175	4.0					
B9445-4	284	3.5					
B9445-6	315	2.5					
B9445-7	248	3.5	5	5	5	5.0	1.067
B9473-2	299	8.0	2	3	3	2.7	1.054
B9473-4	211	5.5	3	3	3	3.0	1.065
B9473-6	301	8.0	3	3	3	3.0	1.058
B9489-2	181	6.5					
B9489-5	226	6.5	4	5	3	4.0	1.067
B9489-6	285	7.0					
B9489-7	198	6.5	3	4	5	4.0	1.066
PA9GPA-1	274	7.0	3	3	3	3.0	1.060
PA9HG-1	388	6.5	1	4	2	2.3	1.068
PA9HX-1	253	5.0	2	2	2	2.0	1.071
PA9HZ-3	249	8.0	2	2	2	2.0	1.066
PA9JJ-2	225	3.5	5	4	5	4.7	1.064
PA9LE-3	347	7.5	4	5	5	4.7	1.062
PA9LV-2	475	8.0	4	3	2	3.0	1.068
PA9LY-2	356	2.5	6	3	4	4.3	1.058
PA9MB-1	409	4.0	6	4	5	5.0	1.056
PAP0021-3	404	4.5	2	5	3	3.3	1.059
PAP0030-2	238	5.5	4	6	5	5.0	1.063
PAP0035-1	367	4.5	5	6	4	5.0	1.061
Atlantic	328	6.2	4	5	4	4.3	1.062
Sebago	358	6.6	1	3	4	2.7	1.054
Superior	248	8.1	3	5	3	3.7	1.069
B6969-2	248	7.0	3	5	3	3.7	1.061

1/ From 9.0 = most desirable to 0.0 = completely undesirable.
2/ Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row planting. Replications = 2. Plot = 20 hill units (20 ft.). Planted = 2/4-5/80. Harvested = 5/27-29/80.

Florida Table 5. Results from 16 russet clones selected for advanced testing at Hastings, Florida -- 1980.

Clone	Yield (cwt/acre) US1A	Tuber appearance[1]	Chip Color[2] Weeks after harvest 1	2	3	Mean	Specific Gravity
B7583-6	366	8.0	4	6	6	5.3	1.071
B9140-7	314	5.5					1.066
Centennial	310	8.0	6	6	7	6.3	1.061
B8697-29	303	4.5					1.056
B9221-14	291	7.2	4	3	4	3.7	1.063
A68678-1	279	4.8					1.066
W 785	273	4.8					1.070
B9219-2	266	6.5					1.063
B9137-9	264	6.5					1.056
A71-72-1	248	5.0					1.060
Norgold Russet	220	3.8					1.063
BelRus USDA	214	8.5	2	3	3	2.7	1.070
WC316-1	207	6.2					1.058
B8833-6	203	8.2	5	6	6	5.7	1.069
BelRus NC	201	8.5					1.064
B8972-1	160	6.0					1.065
LSD (0.05)	80	1.6					
(0.01)	107	2.1					

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row planting. Replications = 4. Plot = 20 hill units (20 ft.). Planted = 2/4-5/80. Harvested 5/27-29/80.

Florida Table 6. Results from 28 russet clones selected for intermediate yield and quality testings at Hastings, Florida -- 1980.

Clone	Yield (cwt/acre) US1A	Tuber appearance[1]	Chip color[2] Weeks after harvest 1	2	3	Mean	Specific gravity
B8529-4	151	3.0					1.068
B8833-6	198	7.5					1.067
B8884-5	188	2.0					1.053
B8934-4	349	4.5	3	2	2	2.3	1.059
B8943-4	205	1.5					1.061
B8977-2	366	4.0	5	6	5	5.3	1.046
B9154-10	275	4.5					1.059
B9162-12	185	5.5					1.060
B9164-1	161	6.0					1.067
B9332-2	251	8.0	5	6	6	5.7	1.064
B9395-7	228	4.0					1.063
B9395-16	196	6.0					1.056
B9399-17	217	6.5					1.055
B9399-19	246	5.5					1.059
B9418-1	250	7.0					1.065
B9418-7	175	8.0					1.069
B9419-1	218	1.5					1.064
B9419-4	126	1.0					1.055
B9419-6	271	3.5					1.056
B9420-2	176	5.5					1.066
B9434-11	123	5.5					1.068
B9434-12	41	1.0					1.063
B9434-16	129	4.5					1.065
B9434-18	167	2.5					1.065
BelRus	245	9.0					1.069
Centennial	328	7.0					1.058
A68678-1	333	1.5					1.060
Norgold Russet	208	3.0					1.064

[1] From 9.0 = most desirable to 0.0 = completely undesirable.

[2] Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row planting. Replications = 2. Plot = 20 hill units (20 ft.). Planted 2/4-5/80. Harvested 5/27-29/80.

Florida Table 7. Results from 6 red clones selected for advanced testing at Hastings, Florida -- 1980.

Clone	Yield (cwt/acre) US1A	Tuber appearance 1/	Specific gravity
Wis 729R	356	6.2	1.062
Wis 806R	341	8.2	1.061
Wis HS-17R	276	6.5	1.056
Wis 774R	265	8.0	1.051
Red La Soda USDA	240	3.2	1.057
Red La Soda NC	227	3.2	1.058
LSD (0.05)	58		
(0.01)	80		

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row at planting. Replications = 4. Plot = 20 hill units (20 ft.). Planted = 2/4-5/80. Harvested = 5/27-29/80.

IDAHO AND EASTERN OREGON

J. J. Pavek, D. Corsini, C. Stanger, and S. Michener

Early testing. About 63,000 single hills representing 444 families were grown at Aberdeen. Of these 2143 were selected on the basis of appearance or biomass potential. 1465 selections were grown in 12-hill plots and 379 were selected on the basis of appearance and yield. Ninety-six clones were grown in preliminary early or late harvest trials at Aberdeen. Selections from this stage are being winter indexed for disease and moved to the Tetonia seed farm. Thirty-six intermediate selections were tested in early and late harvest trials at two locations.

Advanced yield trials. Early harvest advanced trials were conducted at Aberdeen, Idaho and at Malheur County, Oregon. Late harvest advanced trials were conducted at the same two locations and also at Kimberly, Idaho. Fertilizer was applied according to soil tests at each location. Systemic insecticide and preemergence herbicide were used at each location. Metribuzin was applied preemergence to the Kimberly trial followed by two weeks of cool wet weather and serious injury to sensitive clones resulted. Overall yields at Kimberly were low, probably as a result of being set back by the metribuzin. The test plots were irrigated by sprinkler at Aberdeen and Kimberly and by furrow at Malheur County. Vines were beat off just prior to the early harvests and were chemically killed for late harvests. Temperatures throughout the season were cooler than normal at all locations, with higher than average precipitation. This resulted in higher than normal yield and quality for Russet Burbank both in the trials and in commercial fields.

Clones A66102-16 and A72685-2 (Late Harvest ID-OR Tables 1 and 2) have been tested for several years and appear to have good potential for french fry processing. Both have good Verticillium resistance, resulting in consistently high yields, and also have high solids. Russeted A74595-11 (1st year in advanced trials) appears to be the most promising clone in this years tests. It has good disease resistance, high yield and solids, good appearance, and potential as a multipurpose variety. One-fourth of its parentage is from Solanum tuberosum gp andigena. Russeted clone, A74114-4 was the outstanding new clone in the early harvest trials (Tables 3 and 4).

Release of Lemhi Russet. Lemhi Russet (tested as A68678-1) was officially released in 1980. Blackspot bruise was a serious problem in commercial plantings at several locations. Otherwise, performance of this new variety was excellent. Approximately 1000 acres of seed were grown in 1980 and indications are that Lemhi will be grown over a large area in the West and Midwest for more extensive commercial evaluation in 1981.

Disease evaluation. Testing for resistance to Verticillium wilt, Early blight (foliar and tuber phase), common scab, Fusarium dry rot, and leafroll net-necrosis was performed as in the past. A procedure for the evaluation of Erwinia soft rot and blackleg resistance was developed and will be applied to advanced test clones this storage season. Methods of testing blackspot and shatter bruise susceptibility are also being developed. Thirty-three selections have been made on the basis of Fusarium resistance during two years of testing. These were grown in replication and are being evaluated again for

dry rot resistance. Clones which continue to show very high resistance to both Fusarium types will be used as parents.

Other studies. The uniform national biomass trial coordinated by M. Martin was conducted at Aberdeen. The highest yield of solids per acre was produced by A503-42. Further detail is being reported by M. Martin. After the third year of testing protoplast derived Russet Burbank clones, none has shown consistently and significantly higher total yield or yield of U.S. No. 1's than the parent Russet Burbank clone. One clone, SM122, has had significantly higher specific gravity and similar yields to the parent clone for two years. None of the clones with acceptable agronomic performance have shown any improvement in disease resistance.

Distribution. The distribution of breeding selections, varieties, seedling tubers and true seed during 1980 is summarized in ID-OR Table 5.

ID-OR Table 1. 1980 Advanced late harvest yield trials.

Entry	Aberdeen, ID					Kimberly, ID					Malheur Co., OR			
	Total Yield cwt/A	% U.S. # 1's Tot	% U.S. # 1's >10 oz	Spec. Grav.	Fry Color	Total Yield cwt/A	% U.S. # 1's Tot	% U.S. # 1's >10 oz	Spec. Grav.	Fry Color	Total Yield cwt/A	% US #1's Tot	Spec. Grav.	Fry Color
A66102-16	431	73	37	1.082	1.7	444	79	56	1.091	1.7	790	87	1.105	0.7
A68710-5	488	68	35	74	0.9	463	47	26	81	0.8	723	65	90	0.8
A72685-2	517	82	51	83	1.7	455	88	66	90	1.9	793	89	107	1.0
A7353-3	422	71	19	83	1.9	385	75	19	97	1.5				
A7474-12	442	76	44	78	1.4	335	58	37	85	1.3				
A74104-8	549	85	58	80	1.6	431	63	51	80	1.6				
A74104-18	419	75	54	71	1.6	363	73	47	79	1.1				
A74123-3	373	78	29	80	0.7	391	81	28	90	0.7			89	0.7
A74127-2	369	83	29	85	1.3	393	88	58	92	1.5	605	82	102	1.4
A74135-2	431	78	49	73	2.3	187	69	48	72	1.7				
A74265-2	365	80	34	80	1.1	401	88	60	90	1.2	505	81	92	0.9
A74389-1	436	82	51	82	0.9	415	86	54	87	0.8	598	92	95	0.7
A74393-7	312	70	19	83	1.3	263	81	22	92	1.0				
A74595-11	479	85	49	88	0.8	403	87	58	93	0.8	592	90	99	0.8
A74595-17	496	79	62	82	1.4	438	78	53	86	1.1	719	84	96	0.9
Russet B.	423	63	24	79	1.1	414	63	34	87	0.9	683	61	95	0.7
Lemhi	402	74	33	84	0.9	426	88	54	88	0.6	756	89	103	0.7
Butte	387	71	27	77	2.2	464	72	45	90	1.6	729	84	103	0.9
Atlantic	388	86	40	89	0.6	326	90	29	95	0.5				
LSD 5%	70 cwt			.003	0.4	70 cwt			.004	0.4	127 cwt			0.3

ID-OR Table 2. Summary advanced late harvest yield trials - 1980.

Entry	Appearance			Yield		Quality		Disease Resistance				
	Vine Maturity (1-5)	Tuber Description Rus	Shape	Tot[3] Yield cwt/A	% US #1	Spec. Grav.	Fry[4] Color	Dry Rot[5] (0-5)	Leaf-roll Net N. (0-5)	Common scab (0-5)	Vert. Wilt (0-5)	Early Blight (0-5)
A66102-16	3.1	Lt	L-O	438	76	1.087	1.7	3.0	2.3	1.5	1.0	2.0
A68710-5	2.4	M	O-L	475	58	78	0.9	4.6	1.6	0.8	2.9	3.1
A72685-2	3.4	M+	O	486	85	87	1.8	4.1	1.5	3.1	1.1	1.4
A7353-3	3.3	M+	L-O	404	73	90	1.7	1.4	1.2	0	0.6	1.8
A7474-12	2.9	WtLt	O	389	68	82	1.4	4.3	1.1	1.5	1.2	2.3
A74104-8	3.5	Lt	O	490	75	80	1.6	3.1	1.8	2.2	0.7	3.1
A74104-18	2.9	Lt-	L-O	391	74	75	1.4	4.0	1.1	1.5	1.3	2.9
A74123-3	2.4	WtLt	L	382	79	85	0.7	3.3	1.4	0.8	1.9	2.9
A74127-2	3.2	Lt-	L-O	381	85	89	1.4	4.1	1.3	3.2	0.9	2.0
A74135-2	3.4	M+	O	309	76	73	2.0	4.6	2.7	0.3	0.8	1.8
A74265-2	2.4	M	O	383	84	85	1.2	2.7	1.3	1.8	2.1	3.6
A74389-1	3.4	M	O	426	84	85	0.9	4.3	2.0	1.0	0.9	1.9
A74393-7	2.2	M	O	288	75	88	1.2	3.7	0.7	0.1	2.2	3.6
A74595-11	2.9	Hv	L-O	441	86	91	0.8	1.7	1.1	0	1.4	2.5
A74595-17	3.6	M-	O-L	467	79	84	1.3	2.7	1.7	1.1	0.5	1.4
Russet B.	2.7	M	L	420	63	83	1.0	4.1	2.5	0.3	2.1	2.5
Lemhi	2.5	M+	O-L	414	81	86	0.8	4.4	1.5	0.3	1.7	2.9
Butte	2.4	M	L	426	72	84	1.9	3.7	1.6	1.4	2.3	3.3
Atlantic	2.4	Buff	R	357	88	92	0.6	-	0.8	2.5	2.4	3.0

1/ Maturity scale 1=very early, 5=very late.
2/ Wt=white; Lt=light russeting; M=medium russeting; Hv=heavy russeting; L=long; O=oblong; R=round.
3/ Aberdeen+Kimberly data combined.
4/ Late harvest fried after about 2 months storage at 45 F. USDA color chart lightest 00 and 0=0.5 to darkest=4.
5/ Maximum score of either F. sambucinum or F. coeruleum (1979-80 storage season).

ID-OR Table 3. 1980 Advanced early harvest yield trials.

Entry	Aberdeen, ID						Malheur Co., OR			
	Yield cwt/A	% U.S. No. 1's Total %	>10 oz	>6 oz	Spec. Grav.	Fry Color	Yield cwt/A	Total % US #1	Spec. Grav.	Fry Color
A7487-3	291	69	17	48	1.079	0.6	391	68	1.080	0.6
A74114-4	301	84	25	65	77	0.6	483	78	80	0.6
ALR22-2	296	79	21	59	72	1.1	582	81	78	0.6
NDA8694-3	289	64	15	45	64	0.5	559	81	73	0.6
Lemhi	323	79	29	61	82	0.8	581	82	91	0.6
Norgold	253	83	23	64	66	1.4	439	78	73	0.8
Pioneer	393	88	39	75	80	0.7	570	85	83	0.5
Russet B.	316	66	12	45	74	1.0	522	64	80	0.5
Atlantic	369	87	31	70	90	0.6	-	-	-	-
BelRus	264	81	10	53	80	0.5	-	-	-	-
LSD 5%	44 cwt				.003	0.4	99 cwt		.004	0.2

ID-OR Table 4. Summary advanced early harvest yield trials - 1980.

Entry	Vine Maturity (1-5)	Tuber Description Rus	Tuber Description Shape	Tot[3] Yield cwt/A	% US #1	Spec. Grav.	Fry[4] Color	Fus. Dry Rot[5] (0-5)	Leaf-roll Net Nec. (0-5)	Common scab (0-5)	Vert. Wilt (0-5)	Early Blight (0-5)
A7487-3	2.3	M	L-O	341	68	1.080	0.6	1.8	0.8	2.6	2.1	3.5
A74114-4	2.2	M	L-O	392	80	79	0.6	0.4	3.1	1.8	2.2	2.8
ALR22-2	2.0	Lt	O	439	80	75	0.9	3.2	1.3	3.2	3.2	3.5
NDA8694-3	1.8	M-	O	424	75	69	0.6	-	1.1	1.5	4.2	3.3
Lemhi	2.5	M+	O-L	457	81	87	0.7	4.4	1.5	0.3	1.7	2.9
Norgold	1.6	M+	L-O	346	80	70	1.1	-	1.5	0.5	4.3	4.0
Pioneer	2.6	Red	O	481	87	82	0.6	-	1.1	2.5	1.7	3.6
Russet Burbank	2.8	M	L	419	65	77	0.8	4.1	2.4	0.4	1.8	2.5
Atlantic (Ab data only)	2.4	Buff	R	(369)	(87)	(90)	(0.6)	-	0.8	2.5	2.4	3.0
BelRus (Ab data only)	-	Hv	L-O	(269)	(81)	(80)	(0.5)	-	-	-	-	-

1/ Maturity scale 1=very early, 5=very late.
2/ Wt=white; Lt=light russeting; M=medium russeting; Hv=heavy russeting; L=long; O=oblong; R=round.
3/ Aberdeen+Malheur data combined.
4/ Early harvest fried within 1 week of harvest.
5/ Maximum score of either F. sambucinum or F. coeruleum (1979-80 storage season).

ID-OR Table 5. Distribution of Selections, Varieties, and Seedlings - 1980.

LOCATION	COOPERATOR	NUMBER
Clones:		
Argentina	H. Brücher	7
California	D. Kenfield	2
	E. Shahin	1
	H. Timm	1
	R. Voss	55
	E. Wells, Jr.	1
Canada	D. Lynch	216
Colorado	D. Holm	12
Idaho	J. Davis	5
	R. Dwelle	3
	A. Finley	2
	D. Gifford	1
	G. Kleinschmidt	19
	T. Longley	2
	E. Mink	2
	J. Peterson	7
	A. Walz	5
Maine	D. Wilson	2
Maryland	R. Webb	2
Michigan	R. Chase	11
	D. Smith	1
Minnesota	R. Lobitz	4
Nebraska	R. O'Keefe	1
Nevada	B. Schaeffer	1
New York	B. Brodie	67
North Dakota	R. Johansen	1
Ohio	F. Lower	2
Oregon	M. Johnson	4
	A. Mosley	1
	B. Peterson	4
	C. Stanger	51
	G. Vogt	3
Philippines	C. Baniqued	8
	E. Velasco	4
Texas	D. Smallwood	3
Utah	G. Booth	1
	G. Griffen	6
Washington	B. Dean	10
	L. Hiller	10
	M. Martin	39
Wisconsin	M. Cipar	1
	M. Groskopp	7
	J. Schoenemann	12
Seedling tubers or seeds:		
California	R. Voss	58 families
Colorado	J. Twomey	46 "
North Dakota	R. Johansen	68 "
Texas	J. Miller, Jr.	102 "
Maryland	R. Webb	16 crosses

INDIANA

H. T. Erickson

Potato Breeding

Our program continues to emphasize the development of a high yielding, scab resistant variety with good horticultural characters which is early, has better specific gravity than available varieties and is adapted to the high temperatures of the corn belt. Some work on higher protein levels has led to the use of protein-rich clones as parents.

In 1980 approximately 15,000 seedlings from 27 crosses were transplanted to the field in early May. These develop essentially full-size tubers by fall. About 225 selections were made.

Additional advanced lines were planted in 20 hill plots. Thirty-three were retained for further testing. At least two will be included in yield trials. One line, 78-59-1, is very early, has good type and reasonably good dry matter content. All of the more promising clones have been meristemmed. Advanced lines are grown on organic soils. Susceptibility to cracking and hollow heart can be detected rather reliably in this environment.

Regeneration from tuber tissue. Several dozen plantlets produced from tuber discs in vitro were grown for field observation. As many as 10-20% had obvious leaf or growth habit differences when compared with the parent clone, Superior. In view of the current interest in somatic selection this project will be expanded next year to more fully characterize the nature of this variability. Using the tuber disc method it is possible to regenerate large numbers of plants with relative ease.

Potato Variety Trial - Indiana 1980

R.R. Romanowski and R.S. Grenard

The trial was conducted on a muck soil on the Hilger Farms located in north eastern Indiana. 1980 was one of the poorest years for potato yields. The year started out dry, then wet plus excessively high temperatures. Please keep this in mind when going over the data.

Methods

Eight white potato varieties were tested on the Hilger Farm located near Fort Wayne. The varieties were planted on May 19, 1980 in 34 inch rows on 9 inch centers. A randomized complete block design was used with 3 replicates. The soil had a pH 4.5 and an organic matter content of 55%. The field was not irrigated and all cultrual practices were handled by the grower.

Results

The results for this trial are contained in Table 1 and 2. Some general comments based on this and other tests follow:

Superior, Norchip, Katadin - All standard varieties grown for many years on muck soil in Indiana. Norchip is grown for chipping and the two other varieites for table stock.

Michimac - A real interesting potato that outyields Katadin. It should be compared to Katadin and considered as a possible replacement in the future.

Michibonne - Low yielding this year. The possibilities are that it may be discontinued in the future.

Allagash - Very rough on the mucks. A Russet type that probably needs a critical irrigation schedule.

Jemseg - Should be compared to Superior. An excellent potato that will pack out in the shed. The Michigan Crop Improvement Association may increase the potato in the future. Jemseg was bred at New Brunswick Canada and is replacing Superior in many areas of Canada. The variety outyielded Superior in 1979 but did not yield as well in 1980 under adverse conditions (Table 3)

Summary

Of the potatoes tested Jemseg should be looked at in comparison to Superior and Michimac should be compared to Katadin.

ACKNOWLEDGEMENTS: Special thanks are extended to Joe and John Hilger for growing the potatoes and to the following for suppling seed pieces: Floyd Lower - O.A.R.D.C. - Ohio; Dr. Don Young, Agri-Canada, P.O. Box 20280; Fredericton, N.B. E3B, 4X7; Mr. Alvin F. Reeves II, Dept of Plant & Soil Sciences, Aroostock State Farm, Presque Isle, Maine 04769 - supplied allagash seed.

Table 1. Yield, Maturity Ratings and Specific Gravity, Hilger Farm, 1980

Variety	Yield Cwt/Acre Total	B-Size	Culls*	Maturity Rating**	Specific Gravity
Superior	248.7	4.6	25.4	9.0	1.053
Norchip	273.1	9.3	19.0	7.0	1.062
Katadin	229.5	5.6	23.3	5.7	1.040
Michimac	248.1	2.9	15.7	5.0	1.056
Michibonne	168.5	4.2	19.0	6.3	1.054
Allagash	219.6	4.5	44.6	9.0	1.050
Jemseg	217.9	2.9	25.4	9.0	1.062
Purdue 77-3-4	223.7			7.0	
LSD 5%	106.4	4.6	12.3	2.2	.02

*Culls mostly green potatoes
**Ratings on scale 1 = green leaves and turgid stems; 3 = 50% green leaves and turgid stems, 5 = few green leaves and turgid stems, 7 = few green leaves and 50% turgid stems, 9 = dried leaves and stems.

Table 2. Quality Characteristics of Potatoes, Hilger Farm, 1980

Variety	Ratings[1] Scab	Hollow Heart	Growth Cracks	Roughness
Superior	0.0	0.7	0.0	0.0
Norchip	0.0	0.0	0.3	0.7
Katadin	0.0	0.0	0.0	0.7
Michimac	1.0	0.0	0.0	0.3
Michibonne	0.3	0.3	0.3	0.7
Allagash	0.0	1.0	4.0	3.0
Jemseg	0.0	0.0	0.0	0.3
LSD 5%	0.82	0.90	0.5	0.92

[1]Ratings on scale of 0 to 4: 0 = none; 1 = trace; 2 = slight; 3 = moderate; 4 = severe.

Table 3. Average Yields of Potato Varieties in CWT/Acre for Muck Trials 1973-1980.

1973	
Abnaki	450
Katadin	417
Norchip	408
Hudson	394
Kennebec	389
Onaway	377
Superior	305

1974	
Hudson	435
Kennebec	328
Katadin	276
Superior	217
Norchip	152

1976	
Superior	493
W-718	450
Wischip	274

1977	
Norchip	481
Abnaki	456
Atlantic	431
Katadin	388
W-718	337
Oneida	302
Superior	134

1978	
Michimac	700
Denali	634
W-718	582
Katadin	538
Michibonne	490
Atlantic	428
Norchip	370
Superior	320
Oneida	302

1979	
Nipigon	584
Atlantic	568
W-718	562
Denali	480
Norchip	437
Jewel	412
Jemseg	402
Michimac	374
Michibonne	363
Katadin	323
Superior	305

1980	
Norchip	273
Superior	249
Michimac	248
Katadin	230
Allagash	220
Jemseg	218
Michibonne	169

KANSAS

J. K. Greig

Potato Variety and Seedling Evaluation:

Twelve varieties and 16 seedlings were evaluated for yield and quality determinations.

Climatic Conditions:

The average monthly temperature by months follows: April 54° F, May 65° F, June 78° F, July 88° F, and August 84° F. Therefore, yields and specific gravities were low. The planting was irrigated four times in June and July. Defects were numerous. Early maturing types generally were superior to late maturity selections. Table 1 gives the results of this study.

Table 1. Results of Regional and Commercial Potato Variety Trials, Manhattan, 1980

Variety	Yield cwt/Acre Wt. of US#1	Yield cwt/Acre Total	Defects 1/ Scab	Defects 1/ Second growth	Defects 1/ Cracks	Defects 1/ Internal necrosis	Quality Appearance	Quality Specific gravity
White or Russet								
Belrus	189	225	1	2	1	1	2	1.063
Dakchip	152	269	2	3	1	2	2	1.059
Norchip	94	203	2	3	1	1	2	1.053
WC 272	91	187	3	4	1	1	2	1.070
Neb A 219.70-3	84	150	3	2	1	1	2	1.051
Wisc. 723	78	145	2	1	1	1	3	1.056
Superior	78	114	2	1	1	1	1	1.058
Wisc. 726	77	152	2	2	1	1	2	1.058
AK 34-2	68	119	1	1	1	2	1	1.063
Denali	57	115	2	2	1	3	1	1.059
Neb A 129.69-1	56	116	3	2	1	1	2	1.046
MN 9319	53	96	2	2	1	1	1	1.056
Neb A 71.72-1	46	110	2	3	1	2	1	1.056
Tnd 14-1	46	108	2	3	1	1	1	1.055
Belchip	39	112	2	2	1	1	3	1.067
WC 521-12	39	100	1	2	1	1	2	1.062
WC 612-13	33	119	1	5	1	1	3	1.065
Lenhi	15	60	1	3	1	1	2	1.058
Conn Russet	14	89	1	3	1	1	3	1.061
Red								
LA 42-38	162	222	1	2	1	1	2	1.051
MN 5757	144	213	2	5	1	2	2	1.046
Viking	139	168	2	2	1	1	1	1.053
Norland	133	192	2	3	1	1	2	1.042
Red Pontiac	115	216	4	3	1	1	3	1.044
MN 8742	93	207	3	4	1	1	2	1.053
ND 146-4R	83	121	1	2	1	1	1	1.059
LaRouge	77	166	3	4	2	1	2	1.048
Wisc. 806R	36	113	1	3	1	1	1	1.044
LSD	32	48						.002

Planted: April 4

Fertilizer: N - P_2O_5 - K_2O lb/A

45 + 115 + 0 preplant
50 + 0 + 0 April 25
50 + 0 + 0 May 9
50 + 0 + 0 June 17

Spacing: Plants 1' apart in 3' rows

Irrigated: June 11, 18, 27 and July 23

Fungicide: Diathane 45

Insecticides: Sevin, Malathion, and Diazinon

Harvested: August 6 and 7

1/ 1 = superior; 2 = average; and 3 = inferior

Louisiana

J. F. Fontenot, D. W. Newsom, H. M. Brewer,
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W. W. Etzel, W. A. Poillion, and B. W. Wascom

POTATO BREEDING AND DEVELOPMENT

OBJECTIVES:

The principal objectives of the Louisiana potato breeding project are wide adaptability, high yield, frost, heat and drought resistance, insect and disease resistance (particularly late blight and scab), improved culinary quality (including chipping quality, french frying quality, and baking quality), resistance to after-cooking darkening, improved storage ability, better shape and skin color and resistance to tuber greening. Development of an oblong russet type adapted to Louisiana conditions is highly desirable.

Other objectives are to gain a further insight into the physiological changes during rest and to ascertain the effect of growth regulators, applied as preplant, preharvest and postharvest treatments on the production, storage ability and quality of potatoes. The total alkaloid content must be investigated. Air pollution may be a limiting factor in potato production and cultivar selection is essential to minimize yield losses.

Very few Southern states have seen fit to include potato breeding as a research project for their state. Since none of these states, including Louisiana, produce certified seed potatoes it is of utmost importance that wide adaptability be our primary objective. We are unique in this respect because we realize unless a new clone will produce well in the areas of certified seed production (North) it will not be available for Southern production no matter what its producing potential.

Important potato problems are also susceptibility or resistance to air pollution, insects, diseases, frost, heat, drought, and greening and any scientific knowledge that can be obtained could help explain the physiological basis for these factors. Furthermore, any new information obtained that concerns rest, dormancy, or suberization would certainly be a contribution.

Seventeen cultivars were tested in the regional trial and the overall worth of each entry determined Neb. A219.70-3 was rated first, MN8757 second, Red Pontiac third, MN9319 fourth, and Wisc. 723 fifth (Table 1).

The most outstanding advanced clones grown in Louisiana and increased in Wisconsin were 31-124 and 71-96. Both of these clones will be placed in regional trial in 1981. These lines have a white skin, very good shipping quality, and are resistant to scab.

Other advanced clones that are considered worthy of further research are 51-238, 43-18, 42-38, 71-24 and 71-72.

Louisiana Table 1. Regional trial conducted in Baton Rouge in 1980.

Variety	Aver.1/ Mat.	CWT/A Aver. Yield	CWT/A Aver. Yield US #1	Aver. Percent U.S. #1	Aver. Total Solids	Total Solids Per Acre	Gen.2/ Merit Rat.	Chip.3/ Color	General.4/ Notes
EARLY TO MEDIUM EARLY									
ND146-4R	2	86	49	57	16.0	1376		3.0	4.3
Norland	2	103	63	61	15.2	1566		6.0	4.4
MEDIUM TO LATE									
Neb. A129.69-1	5	81	37	46	15.2	1231		3.5	1.8
Neb. A71.72-1	4	137	56	41	15.4	2110		4.6	3.0
Neb. A219.70-3	4	173	122	71	15.6	2699	1	2.4	4.4
MN 8742	3	123	63	51	15.2	1870		4.0	2.0
MN 8757	3	104	81	78	15.2	1581	2	5.3	1.9
MN 9319	5	141	68	48	15.2	2143	4	3.3	2.6
Wisc. 723	3	129	59	46	15.2	1961	5	2.9	1.1
Wisc. 726	4	148	59	40	15.2	2250		3.5	1.9
Wisc. 806R	No Stand	---	---	--	----	----	--	---	---
La. 42-38	5	79	26	33	15.2	1201		3.9	2.1
AK 34-2	3	72	37	51	15.8	1138		3.3	4.8
TND 14-1Russ	2	22	15	68	----	----	--	---	---
Red Pontiac	4	193	120	62	15.2	2934	3	3.5	2.5
Russet Burbank	5	68	10	15	15.2	1034		3.8	1.5
Norchip	3	54	21	39	16.5	891		1.6	2.3
AVERAGE									

1/ 1-Very Early-Norland maturity; 2-Early-Irish Cobbler maturity; 3-medium-Red Pontiac maturity; 4-Late-Katahdin maturity; 5-Very Late-Kennebec or Russet Burbank maturity.

2/ Place top five among all entries including check varieties; disregard maturity classification. (Rate first, second, third, fourth, and fifth (in order) for overall worth as a variety.

3/ Chip Color - PCII Color Chart or Agtron.

4/ After cooking darkening: rated on a scale of 1-10, 1 = white, 10 = gray

With a limited amount of information we consider 14 selections made in 1978 (Table 2) and 22 selections made in 1979 worthy of further research.

Louisiana Table 2. Clones selected in 1978 saved at Rhinelander-1980.

Clones	Parentage	Remarks
81-5	Minn. 1317 X 71-110	Excellent, very nice, good chips.
81-7	Cobbler X 11-199	Good chips.
81-20	01-115 X 21-59	Very smooth, good foliage, very good 1979 and 1980.
81-24	01-115 X 21-59	Good top, very good in 1980.
81-81	11-1 X 11-24	Poor processor.
82-119**	11-94 X 21-71	Seed, very good type.
81-134*	12-34	Russet.
82-137	12-36	Good top, seed.
82-150**	12-36 X 12-34	Good top.
82-154	12-36 X 12-34	Excellent, seed.
82-156	12-36 X 12-34	Seed.
81-167**	21-99	H.Y., very good type.
81-173*	ND 8850-2	Excellent top, seed.
81-178*	ND 8891-3	Seed, excellent top.

We were informed that Campbell Soup Company had terminated its breeding program and honored to be offered their breeding material. After observing hundreds of their progeny were selected 53 individuals that should help us accomplish our objectives (Table 3).

Observations were made in Louisiana in the fall of 1980, and indications were that 42-38 could be cut rather than whole tubers being planted. The best lines in the fall were 31-124, LaChipper, and Red LaSoda, and Minnesota 8757.

The 1980 growing season was not the best for potato production which is reflected in the regional trial presented in Table 1. Numerous examples could be presented in tabular form, but we choose to report on only one other location to show the poor yields that were obtained. Four cultivars and ten seedlings were grown at Chase, Louisiana in a replicated yield test in 1980 (Table 4). Single row plots 40 feet long and 40 inches wide were arranged in a randomized block design.

Five-hundred pounds per acre of 12-24-12 fertilizer was broadcast and the field put up in rows, February 20, 1980. Seedpieces approximately one and one-half oz. each were spaced 12 inches apart in the row on February 22, 1980. A top dressing of 33 lbs. of nitrogen from ammonium nitrate was applied at crop emergence.

No insecticides or fungicides were required during the growing season.

Louisiana Table 3. Campbell soup clones selected in Wisconsin-1980.

La No.	Campbell Soup Co.	Parents	Shape	Maturity	Vigor
01-1	95	AS11-4R X BR7108-2	R	M	F
01-2	158	F62008 X BR6820-16	R-O	ML	F
01-3	168	F62008 X BR6820-16	R	ML	G
01-4	213	CC05-17 X B6563-2	R	ML	F
01-5	260	CD106-16 X BR6920-26	R-O	ML	P
02-6	650	G694-3Rd X RARITAN	R-O	ML	G
01-7	708	WN345-15 X Camp 13	Ob	ML	F-G
01-8	989	AS201-4* X B5090-11	R-O	ML	F-G
01-9	1021	AS201-4* X NOOKSACK	R	ML	G
01-10	1092	ATLANTIC X RARITAN	Ob	ML	G
01-11	1262	CA55-24 X MP74-4	R	ML	F-G
01-12	1825	BR6159-8 X BR5967-7	R	ML	F-G
02-13	1984	AS125-3R X CD124-1R	R-O	ML	G
01-14	1988	B6603-6 X BR6317-21	R	ML	F-G
01-15	2065	WAUSEAN X AS10-8	R-O	ML	F
01-16	2077	CA67-2 X B7680-6	Ob	M	F
01-17	2085	RARITAN X CA29-11	R-O	ML	F
01-18	158	F62008 X BR6820-16	R-O	ML	F
01-19	171	F62008 X BR6820-16	R	ME	F
01-20	296	WAUSEAN X CD100-9R	R-O	M	F
01-21	297	WAUSEAN X CS100-9R	R	ML	F
01-22	390	B6116-18 X NY57	R-O	ML	F-G
01-23	412	B7196-4R X Camp 13	R-O	ML	G
01-24**	531	CA53-6 X Camp 13	Ob	M	F
01-25	546	CA67-2 X ATLANTIC	R-O	ML	F-G
01-26	694	NY57 X CD12-18	R-O	ML	F
01-27	816	RARITAN X Camp 13	R-O	M	F
01-28	1071	ATLANTIC X RARITAN	Ob	ML	F-G
01-29	1092	ATLANTIC X RARITAN	Ob	ML	G
01-30	1336	CD112-4a X BELRUS	Ob	ML	F
01-31	1854	WAUSEAN X BR6293-12	R-O	M	F
01-32	2070	B7154-10 X Camp 12	Ob	ML	F
01-33*	2172	WAUSEAN X B5647-9	R	L	G
01-34	2176	B6595-12 X B6519-5	R-O	ML	F
01-35	2229	B6987-18 X Cd137-5R	R-O	ML	F
01-36	2233	Camp 13 X B6563-2	Ob	ML	F
01-37*	2095	B5643-5 X BR6317-6	R-O	M	P-F
01-38	2094	B5461-4 X B5141-6	R-O	ML	F
01-39	2115	BR7072-5 X Camp 13	R	M	P-F
01-40	2093	B6039-1 X Br5967-7	Ob-L	L	G
01-41	2105	BR6316-5 X B6376-6	R-O	L	G
01-42	2133	Ca11-3 X BR6820-16	R-O	ML	F-G
01-43	2143	B5422-9 X ND5737-3	R-O	ML	F
01-44*	2171	BR5960-9 X B6376-6	R-O	L	G
01-45*	2172	WAUSEAN X B5647-9	R	L	G
01-46	2192	G6546-6p X BR6321-1	Ob	M	F
01-47	2218	KATAHAIN X BR7105-14	R-O	ML	F-G
01-48	500	BR7104-10 X B7152-12	R	M	P-F
01-49	933	RARITAN X NY57	R-O	ML	F
01-50	1357	WS68-1-8 X C7294-10	R	M	F
01-51	1464	B6603-6 X BR6317-21	R-O	M	F
01-52	1810	BR5991-25 X B5675-5	R-O	ML	F-G
01-53	1907	BR6261-1 X B6519-5	R	L	F

Louisiana Table 4. Yield of potato cultivars in hundred weights per acre-1980. Chase, Louisiana.

Cultivar	Skin Color	No. 1 cwt/A	No. 2 cwt/A	Cull cwt/A
31-128	White	36	29	13
81-167	White	17	24	14
71-49	White	26	43	24
42-38	Red	33	28	20
61-130	White	52	30	17
72-99	Red	63	42	23
Red LaSoda	Red	69	29	18
Bell Chip	White	43	28	18
81-18	White	52	20	18
Atlantic	White	47	27	11
La Chipper	White	45	21	15
31-124	White	33	40	20
81-17	White	32	18	14
51-238	White	33	33	18
LSD .05		6		
.01		8		

Red LaSoda was superior to all entries in yield of No. 1 potatoes. The red seedling 72-99 produced more No. 2 potatoes than Red LaSoda and was equal to it in yield of marketable potatoes. Two white skinned seedlings, 61-130 and 81-18 exceeded LaChipper. The remaining entries, all of which were breeding lines, were inferior to the standard cultivars.

CULINARY STUDIES

Culinary studies were conducted on all clones grown in Louisiana. The results obtained from only two locations are reported in this section.

In general the highest specific gravity of potatoes harvested in Louisiana were produced in Hammond (Table 5). The three clones with the highest gravity were Atlantic, 43-18, and 42-38. The best chips were obtained from Atlantic, 43-18, Belchip and 81-169. Clones making good french fries were Belchip, Atlantic, LaChipper, 43-18, and 51-53. Lines showing the least darkening after cooking were 81-169, 71-96, 51-53, 81-8, and 42-38.

Data from culinary studies conducted at Baton Rouge on clones grown at Calhoun are presented in Table 6. Again the highest specific gravity was obtained from Atlantic. Quality chips were made from Atlantic, 71-23, 43-18, and 81-28. Excellent french fries were obtained from Belchip, Atlantic, 71-23, 71-81 and 43-18. LaChipper, Belchip, and 81-28 were classed as the top clones in showing the least after-cooking darkening.

Louisiana Table 5. Culinary studies conducted at Baton Rouge on clones grown at Hammond in 1980.

Variety	Chip* Color	Fry** Color	After Cooking*** Darkening	Specific Gravity
L62-183	5.6	2.6	2.1	1.078
L82-70	5.2	2.8	3.8	1.073
Atlantic	2.6	0.8	2.8	1.088
L61-130	4.0	2.2	2.8	1.073
LaChipper	3.8	1.0	2.3	1.078
L71-72	4.0	1.6	2.2	1.068
L81-8	4.0	2.0	1.3	1.070
Red LaSoda	5.4	2.4	3.0	1.068
Belchip	3.0	0.2	3.0	1.074
L81-169	3.2	1.6	1.5	1.083
L31-124	4.2	2.0	2.2	1.080
L32-157	5.0	2.3	2.1	1.077
L43-18	2.8	1.2	2.4	1.085
L42-38	6.2	1.8	1.3	1.080
L51-53	4.6	1.2	1.7	1.078
L71-36	5.0	2.0	1.5	1.072

* Fried 1½ minutes @ 360°F
Rated on a scale of 1-10, 1=best
According to Potato Chip Institute Color Chart

** Fried 4 minutes @ 360°F
Rated on a scale of 0-4, 0=best
According to Potato Chip Institute Color Chart

*** Boiled 35 minutes, then peeled
Exposed 2½ hours
Rated on a scale of 1-10, 1=white; 10=gray

Louisiana Table 6. Culinary studies conducted at Baton Rouge on clones grown at Calhoun in 1980.

Variety	Chip* Color	Fry** Color	After Cooking*** Darkening	Specific Gravity
L31-124	3.8	1.9	3.0	1.068
L31-128	3.5	2.2	2.0	1.070
L42-38	3.5	2.0	3.0	1.077
L43-18	3.3	1.7	3.4	1.078
L61-18	6.5	3.7	2.8	1.067
L62-183	4.7	3.7	1.9	1.071
L71-23	3.2	1.2	2.0	1.060
L71-49	3.5	2.0	2.3	1.074
L71-81	3.5	1.3	2.6	1.070
L81-28	3.3	2.3	1.3	1.070
L82-70	5.7	2.7	2.0	1.063
L82-152	4.8	2.2	2.3	1.073
Atlantic	2.5	1.0	3.4	1.084
Belchip	3.5	0.5	1.3	1.078
Kennebec	3.7	2.5	2.8	1.072
LaChipper	4.3	2.0	1.3	1.077
Red LaSoda	5.5	3.2	1.4	1.066

* Fried 1½ minutes @ 360°F
Rated on a scale of 1-10; 1=best
According to Potato Chip Institute

** Fried 4 minutes @ 360°F
Rated on a scale of 0-4, 0=best
According to Potato Chip Institute Color Chart

*** Boiled 35 minutes, then peeled
Exposed 2 hours
Rated on a scale of 1-10; 1=white, 10=gray

MAINE

S. S. Leach, Raymon E. Webb and David Wilson

Resistance to Fusarium Tuber rot (Fusarium roseum 'Sambucinum' and Fusarium solani 'Coeruleum'). Inoculum for this test was grown on potato dextrose agar. Spores were washed from seven day old cultures and adjusted to 50,000 per ml. The tubers of the test clones were inoculated with a hypodermic syringe midway between the bud and stem ends. The inoculum (100 spores) was injected into the tubers 7 mm below the tuber surface. The inoculated tubers were stored in a controlled environment room maintained at 55°F (13°C) and 95 percent relative humidity for 21 days. At the end of the storage period, the tubers were removed and scored for tuber rot development and amount of sprouting. The degree of rot in a tuber was determined by cutting through the inoculation sites and observing the degree of infection. This year B7200-33 was used as the resistant standard. B5881-5 for the second year showed a high degree of resistance to F. roseum 'Sambucinum' and because of lack of tubers no test was conducted with F. solani 'Coeruleum'. B6343-4 and B6372-1 both showed good resistance. No sprout data was recorded in 1960.

Maine Table 1. Clones tested in Fusarium tuber rot resistance-trials -- 1980-1981.

Clone	Fusarium Rating[1/]	
	F. roseum 'Sambucinum'	F. solani 'Coeruleum'
B7200-33	8	
B7805-1	3	
B8685-4	1	
B8710-16	2	
B8751-6	1	
B8833-6	2	7
B8848-2	1	6
B8881-5	8	
B8934-4	1	7
B8939-8	2	8
B8943-4	7	8
B8972-1	7	7

[1/] Rating 0-9: 9 = no disease; 0 = severe disease symptoms.

Table 1. Results of Russet clones grown at Newport, Maine.

Clone	Seed Planted Per Plot	Yield/Plot	Sp.gr.	Fry Test FF	Fry Test Chip	Shape & Size
B8833-6[1/]	13	21.3	1.080	4	9	Good
B8848-2	15	31.0	1.078	4	9	Growth cracks Rhizoctonia?
B8934-4	22	26.9[2/]	1.079	4	8	Many small tubers-Late
B8939-8	20	31.2	1.078	5	10	Many small tubers-Late
B8943-4	20	30.3	1.086	4	8	Poor many round
B8972-1	26	27.6[2/]	1.091	3	7	Good shape-some Rhizoctonia best of those we had.

1/ Planted May 5, 1980 harvested September 21, 1981.
2/ High amount of Rhizoctonia observed in field.

MAINE - 1980

Hugh J. Murphy and Leigh S. Morrow

Cooperative variety trials were conducted during 1980 at Presque Isle, Grand Isle, and Newport, Maine. Soil and weather conditions during mid-May and into June were very dry and cool. Late June and July were very warm with good soil moisture. Most of August was very dry which hurt yields at Newport. September rains in Aroostook sized up the late maturing varieties very well.

Plots at all test locations were single rows, 25 feet long, and replicated six times per variety. Planting, killing, and harvesting dates, seedpiece spacing, and fertilization rates used at each location are presented in Maine Table 4.

Yields and specific gravities for all varieties grown at all locations are presented in Maine Table 1. The ten highest yielding varieties considering the all-location average in descending order were: B6043-WV6, AF92-3, W718, B8086-3, CD106-16, F68036, BR5991-WV16, Kennebec, Buckskin, and G6666-4Y. The 11 highest varieties in specific gravity were: Trent, Denali, Belchip, Atlantic, BR7088-18, AF186-2, BR5991-WV16, Buckskin, AF186-5, G6666-4Y, and G6880-1.

Tuber size distribution determinations of U.S. #1 and U.S. #1 (size A) are presented in Maine Table 2. The early-medium early and medium maturing varieties produced a high percentage of tubers below 2½ inches or 4 ounces. No oversized tubers were found (>4 inches). Growth cracks, misshapen, knobby, and sunburned tubers were very prevalent in most varieties. Many varieties had large numbers of tubers with hollow heart.

Results of the first chipping and french fry color tests with tubers from 50° F storage are presented in Maine Table 3. Seedling C7232-4 was the only entry that had acceptable chip color (<7.0) and at all locations. Of the varieties grown at Presque Isle, 18 had acceptable french fry color (<3.0). Only four varieties, however, had acceptable french fry texture (<1.2).

Complete details of the Maine cooperative variety trials are presented in the 1980 Northeastern Potato Variety Trial report which is made available from cooperators in each State and also from the Public Information and Central Services (PICS), University of Maine; Orono, Maine 04469.

Maine Table 1. Yield and specific gravity of potato varieties grown at Presque Isle, Grand Isle, and Newport, Maine - 1980.

Variety	Presque Isle		Grand Isle		Newport	
	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity
Allagash Russet					208	1.081
Atlantic					293	1.100
Belchip					277	1.100
Buckskin	445	1.090	436	1.084	256	1.089
Butte	357	1.086	327	1.083	262	1.091
Centennial Rus.	315	1.076	283	1.073		
Cobbler	384	1.082	322	1.075	311	1.078
Croatan	385	1.077	302	1.067	283	1.075
Denali					230	1.102
Katahdin	420	1.081	351	1.073	275	1.083
Kennebec	437	1.087	394	1.076	322	1.078
Lemhi	365	1.088	317	1.084	288	1.086
Norchip					276	1.087
Rideau	355	1.082				
Russet Burbank	369	1.088	306	1.081		
Shepody	362	1.089	326	1.078	288	1.081
Superior	390	1.084	337	1.073	276	1.072
Trent	351	1.103				
AF92-3	459	1.076	393	1.069		
AF186-2					189	1.096
AF186-5					250	1.088
AF238-21	425	1.081	427	1.068	253	1.086
AF238-66	434	1.077	372	1.064	265	1.086
AK24-3	362	1.092	260	1.077	286	1.084
B6043-WV6	436	1.081				
B8086-3	423	1.082	404	1.081	314	1.083
BR5991-WV16	410	1.094	435	1.083	367	1.097
BR7088-18					248	1.098
BR7093-23					344	1.083
C7232-4	315	1.080	304	1.074	168	1.082
C7358-14A	352	1.078	359	1.074		
C7358-26A	374	1.076	345	1.066		
CD106-16	393	1.086	420	1.079		
F68036	414	1.084	398	1.073		
F69026	411	1.073	363	1.066	286	1.076
G6666-4Y	364	1.088				
G6880-1	269	1.088				
G712	291	1.079				
W718	432	1.076	439	1.064	405	1.071
Bayes L.S.D. (0.05)	33	0.005	46	0.005	58	0.006

Maine Table 2. Percentage of yield between 1-7/8 and 4 inches in diameter for varieties grown at Presque Isle, Grand Isle, and Newport, Maine - 1980.

Variety	Presque Isle		Grand Isle		Newport	
	1-7/8 to 4 inches	2-1/2 to 4 inches	1-7/8 to 4 inches	2-1/2 to 4 inches	1-7/8 to 4 inches	2-1/2 to 4 inches
Allagash Russet					94.0	23.6
Atlantic					95.1	44.3
Belchip					95.5	48.2
Buckskin	91.8	47.6	93.7	61.1	93.5	41.8
Butte	46.5% 4-10 oz.		51.6% 4-10 oz.		47.0% 4-10 oz.	
Centennial Russet	57.0% 4-10 oz.		52.0% 4-10 oz.			
Cobbler	94.8	39.7	95.4	50.8	94.9	50.2
Croatan	95.1	49.8	94.9	58.3	93.8	42.9
Denali					93.8	26.9
Katahdin	94.6	57.0	96.8	64.7	95.4	58.4
Kennebec	96.4	56.6	96.2	67.9	95.1	63.1
Lemhi	67.2% 4-10 oz.		55.0% 4-10 oz.		54.1% 4-10 oz.	
Norchip					91.7	31.8
Rideau	93.5	58.8				
Russet Burbank	58.7% 4-10 oz.		54.7% 4-10 oz.			
Shepody	95.1	40.5	91.4	57.8	52.9% 4-10 oz.	
Superior	95.0	33.7	95.2	55.7	94.8	25.1
Trent	95.9	62.5				
AF92-3	95.5	38.1	94.0	51.1		
AF186-2					78.7	2.8
AF186-5					93.6	25.5
AF238-21	95.4	39.3	93.8	57.8	95.2	23.3
AF238-66	91.5	24.5	94.5	39.1	85.6	17.4
AK24-3	96.7	53.9	94.2	51.0	95.9	56.0
B6043-WV6	93.8	43.9				
B8086-3	94.2	52.8	95.4	60.2	95.6	47.4
BR5991-WV16	95.9	43.3	94.3	50.6	94.7	50.2
BR7088-18					94.9	46.1
BR7093-23					95.3	46.2
C7232-4	95.0	46.0	97.5	66.4	87.9	16.4
C7358-14A	94.1	40.4	94.4	51.4		
C7358-26A	93.8	34.3	91.6	43.9		
CD106-16	93.3	49.6	95.2	56.4		
F68036	96.9	55.2	94.7	66.4		
F69026	96.1	43.4	96.2	61.4	94.9	38.8
G6666-4Y	97.0	66.6				
G6880-1	97.2	53.5				
G712	93.6	39.8				
W718	94.2	57.6	94.2	68.3	94.8	60.4

Maine Table 3. Chip color and french fry color and texture indices for potato varieties grown at Presque Isle, Grand Isle, and Newport, Maine - 1980.

Variety	Presque Isle			Grand Isle	Newport
	Chip	French fry		Chip	Chip
	Color[1]	Color[2]	Texture[3]	Color[1]	Color[1]
Allagash Russet					8.1
Atlantic					9.7
Belchip					9.2
Buckskin	8.8	2.5	1.8	8.7	10.0
Butte	10.0	5.0	1.6	10.0	10.0
Centennial Russet	10.0	5.0	3.0	10.0	
Cobbler	9.0	2.7	1.0	9.0	9.8
Croatan	8.1	2.0	1.7	8.5	9.6
Denali					9.8
Katahdin	9.5	3.3	1.4	8.9	9.8
Kennebec	8.8	2.3	1.0	9.5	9.9
Lemhi	10.0	3.9	1.8	10.0	10.0
Norchip					9.4
Rideau	9.5	3.8	1.9		
Russet Burbank	9.5	3.6	1.3	9.3	
Shepody	8.7	3.6	2.6	10.0	10.0
Superior	7.8	2.3	1.6	8.6	10.0
Trent	8.1	2.3	1.4		
AF92-3	9.8	3.7	2.6	10.0	
AF186-2					8.7
AF186-5					10.0
AF238-21	7.2	1.7	1.7	9.1	9.7
AF238-66	7.1	1.6	1.5	8.9	10.0
AK24-3	9.1	2.8	2.0	9.5	10.0
B6043-WV6	10.0	4.8	1.4		
B8086-3	8.8	3.2	1.7	8.8	10.0
BR5991-WV16	8.7	2.5	1.5	9.3	10.0
BR7088-18					9.1
BR7093-23					9.5
C7232-4	4.9	1.0	1.5	5.1	6.8
C7358-14A	7.5	1.9	2.2	8.7	
C7358-26A	8.7	2.6	1.4	9.2	
CD106-16	9.6	3.2	1.4	9.5	
F68036	10.0	4.7	2.1	10.0	
F69026	6.6	2.0	1.0	7.3	9.6
G6666-4Y	9.8	3.0	1.8		
G6880-1	7.3	1.7	1.1		
G712	6.9	2.0	1.3		
W718	8.1	2.0	2.3	9.1	9.3
Bayes L.S.D. (0.05)	0.6	0.5	0.8	0.5	0.4

Maine Table 3 - continued

[1]Chips with lower indices are lighter in color as read on PCII Reference Chart 1206-U.

[2]French fries with lower indices are lighter in color as read from USDA Color Standards for Frozen French Fries.

[3]Lower texture indices indicate a mealier texture.

Maine Table 4. Pertinent information about the Maine Cooperative Potato Variety Trials - 1980.

Location and Maturity Season	Date Planted	Date Killed	Date Harvested	Fertilization	Spacing
Presque Isle					
Early & Med. Early varieties	May 20	August 28	September 10	130-130-130	1/
Medium varieties	May 20	September 8	September 15	130-130-130	1/
Medium Late varieties	May 20	September 13	September 28	130-130-130	1/
Late varieties	May 20	September 19	October 2	130-130-130	1/
Russet & Long Type varieties	May 20	September 19	October 9	130-130-130	2/
Grand Isle					
Early & Med. Early varieties	May 23	August 31	September 10	150-225-225	1/
Medium varieties	May 23	September 10	September 20	150-225-225	1/
Medium Late varieties	May 23	September 10	September 20	150-225-225	1/
Late varieties	May 23	September 20	September 30	150-225-225	1/
Russet & Long Type varieties	May 23	September 30	October 10	150-225-225	2/
Newport					
All varieties	May 29	October 8	October 16	140-140-140	3/

[1]Seedpieces of all varieties spaced 8 inches apart.

[2]Seedpieces of Butte and Russet Burbank spaced 16 inches apart.
Seedpieces of Lemhi spaced 14 inches apart.
Seedpieces of Centennial Russet spaced 10 inches apart.
All other seedpieces spaced 8 inches apart.

[3]Seedpieces of Butte spaced 16 inches apart.
Seedpieces of Lemhi spaced 14 inches apart.
All other seedpieces spaced 8 inches apart.

MAINE -- 1980

Alvin F. Reeves and Robert B. Long

Potato Breeding

Seed and seedling production. Since spindle tuber viroid was detected in two of the parents intended for crossing, none of the seeds were retained this year. From open-pollinated fruits of 12-hill plants, 589,100 seeds were harvested. Seeds from 256 family lines were planted in June. Some of these were grown in the greenhouse; others were moved outdoors, but grown to maturity in plastic trays. From 29,845 seedlings, 24,481 "A" size tubers were harvested (82%), and 17,607 "B" size tubers (59%).

Seedling selection. A total of 294 selections were saved from approximately 55,700 single-hill seedlings. From the 1220 12-hill selections, 133 were selected for further testing. Ten third-year selections were tested in 20-hill, 60-hill, and disease plots. Three were discarded because of excessive growth cracking which was exceptionally bad this year.

Disease tests. Resistance to virus X was found in 13/82 selections tested; to common scab in 13/33; to net necrosis in 28/33; to acid scab in 13/23; to late blight in 6/22; to early blight in 11/55; to hollow heart in 42/82; to frost in 30/66; to leafroll in 1/85; and to greening in 20/82. Tests conducted by Dr. Brodie showed 4/38 resistant to golden nematode.

Yield tests. A total of 117 advanced selections were tested in six separate tests. Thirty-six outyielded check varieties; 47 had higher specific gravities; and twelve of these were better on both counts. Each selection in each test comprised four replications of 20 hills each planted in a randomized complete block design. Fertilizer in the form of 14-14-14 was applied at different rates, depending on the maturity of the selections tested. Early selections received 115 pounds of nitrogen per acre; medium maturity selections received 130 pounds; and medium-late maturing types received 145 pounds. Seedpiece spacing was 10 inches in 34 inch rows.

Selections under consideration for release. The selection AF 41-2 has been dropped since it was found to carry verticillium on the seedpieces. Three other selections will be tested in commercial fields in 1981: AF 186-5, AF 205-9, and CC 26-1a. The first two are golden nematode resistant and multipurpose potatoes. The first one is more adaptable to the fresh market, and the second is very good for chipping. The third selection is similar to Katahdin, but with more bruise resistance, higher yields and dry matter, and better reconditioning from cold storage.

Table 1 lists the most advanced of the Maine selections along with their characteristics.

Maine Table 1. Characteristics of some advanced potato clones in the Maine breeding program

Pedigree Number	Maturity[1]	Skin color[2]	Type of tuber[3] [4]	Yielding ability[4]	TGA[5] content[4]	Flavor[4]	Cooked color, table use[4]	Cooked color, French fries[4]	Texture of french fries[4]	Percent dry matter[4]	Storage life[4]	Bruising[4]	Resistance to[6]									
													Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Verticillium	Ring rot	Golden nematode	Common scab
AF 186- 5	M	W	G	A	A	A	M	G	G	A	A	G	S	S	R	S	S	M	M	S	R	M
CC 26-1a	M	C	G	A	M	A	A	A	G	G	M	G	R	S	R	S	S	S	S	S	S	S
AF 205- 9	ML	B	G	G	A	M	M	G	A	G	A	F	R	S	R	S	S	S	S	S	R	S
CF 7353- 1	ML	Pu	G	G	A	A	G	G	G	A	F	F	S	S	R	S	M	S	R	S	S	S
AF 238-66	ML	W	A	G	A	A	A	M	M	A	F	F	S	M	R	M	S	S	S	S	S	S
CF 7358-14	M	W	G	G	G	F	F	A	A	A	A	F	R	M	R	M	M	M	S	S	R	M
CF 7358-26	M	R	G	G	A	F	F	M	A	A	A	F	R	S	R	S	M	M	S	F	S	M
AF 236- 1	ML	C	G	G	G	A	G	G	A	G	F	F	S	S	R	R	M	M	S	S	R	M
CF 7419- 1	M	W	G	G	A	A	A	G	G	G	F	F	S	S	R	S	M	M	S	F	S	S
AF 92- 3	ML	W	G	G	A	F	F	U	M	M	F	F	R	S	R	R	M	R	S	S	S	R
AF 324- 1	E	W	G	A	G	F	F	G	G	G	A	F	S	S	R	S	S	S	S	F	S	S
AF 238-21	ML	W	G	G	G	A	G	A	A	A	F	F	S	S	R	M	S	S	S	S	S	S
CF 7523- 1	M	W	G	G	A	F	F	A	G	G	A	F	S	S	R	M	M	S	M	F	R	M
WF 591- 1	M	R	G	G	A	F	F	A	G	G	F	F	S	S	R	S	M	S	M	S	S	S
AF 201-25	ML	B	G	G	G	F	F	M	M	A	F	F	S	S	R	R	M	M	S	S	R	S

Pedigree Number	Maturity[1]	Skin color[2]	Type of tuber[3] [4]	Yielding ability[4]	TGA[5] content[4]	Flavor[4]	Cooked color, table use[4]	Cooked color, French fries[4]	Texture of french fries[4]	Percent dry matter[4]	Storage life[4]	Bruising[4]	Resistance to[6]: Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Verticillium	Ring rot	Golden nematode	Common scab
AF 221-1	L	C	G	G	A	F	F	G	G	G	F	F	S	S	R	S	R	S	S	S	S	S
A 70114-1	M	R	G	G	M	A	G	G	A	G	F	F	S	S	R	S	M	M	R	S	S	R
CF 76183-2	ME	C	G	G	A	F	F	G	A	G	G	F	S	F	R	M	S	S	S	F	F	R
CF 7679-15	M	C	G	G	A	A	A	M	A	G	G	F	R	F	R	S	S	S	R	F	F	S
CF 7688-9	M	C	A	G	A	F	F	G	A	G	A	F	S	F	R	S	S	S	S	F	F	S
CF 7505-5	ME	W	A	G	A	A	M	G	A	G	A	F	S	S	R	S	M	S	S	F	S	M
AF 330-1	ME	WC	A	G	A	A	A	G	M	G	A	F	S	F	R	M	M	S	M	F	S	S
CF 7608-9	ME	C	G	G	A	F	F	G	U	A	G	F	R	F	R	S	S	S	M	F	F	M
CF 76123-6	ME	C	G	G	M	F	F	G	G	A	G	F	S	F	R	S	S	S	S	F	F	S
AF 307-5	M	W	G	G	A	A	M	A	A	M	A	F	S	R	R	M	M	M	S	F	S	R
AF 332-9	M	B	A	A	A	A	G	M	G	G	G	F	S	S	R	M	M	S	R	F	R	M
AF 299-12	ME	W	A	A	A	A	G	G	G	A	F	F	S	S	R	M	M	M	S	F	S	M
CF 7506-1	ME	R	M	G	A	A	A	M	M	A	G	F	S	R	R	S	S	S	S	F	M	M
CF 7666-11	E	W	G	A	A	A	A	G	M	A	G	F	F	F	R	S	S	S	S	F	F	S
AF 303-5	ML	W	G	G	M	U	F	A	M	A	M	F	S	S	R	M	M	S	R	F	S	S
WF 564-3a	M	R	G	A	A	F	F	U	A	M	G	F	R	S	R	R	M	M	S	S	S	R

1/ Maturity: E = early, M = medium, L = late.

2/ Color: R = russet, W = white, B = buff, Pu = purple, C = cream.

3/ Type of tuber includes uniformity of shape, overall appearance, and presence of defects.

4/ Rated as: U = unacceptable, M = marginal, A = acceptable, G = good, or F = further testing needed.

5/ TGA = total glycoalkaloids.

6/ Resistance: R = resistant, M = moderately resistant, S = susceptable, F = further testing needed.

MINNESOTA POTATO BREEDING PROGRAM

Florian Lauer, David Wildung, John Wiersma, Neil McHale,
Richard Veilleux, Ezzaldin Abusteit and Richard Wenkel

Research Studies

Increased yield is a major objective. Experience with 4x S. tuberosum x 4x S. tuberosum crosses suggests that this is not a viable approach; hence, we have been doing studies on development and use of 2x S. phureja parents with meiotic restitution. In our studies we have asked first, do 4x S. tuberosum—2x S. phureja have potential in our production area, and second, are 2x S. phureja parents better than 2x S. phureja—S. tuberosum parents?

Breeding value of 2n pollen from Phureja—haploid Group Tuberosum diploid hybrids (DHs) and Phureja was compared in crosses with tetraploid cultivars. Mean total yield for Phureja-derived (PT) hybrids significantly exceeded that for DH-derived (DHT) hybrids, and did not differ from that for cultivar parents. PT hybrids had the largest range for total yield, with 13 percent of the population between 4200 and 5750 gm/plant (0.8 and 4.6 percent for DHT hybrids and cultivars, respectively). Moreover, the tail of the frequency distribution of total yield for PT hybrids extended 920 gm/plant above that for cultivars. Mean marketable yield for PT hybrids significantly exceeded that for DHT hybrids, but was significantly below that for cultivars. However, the tail of the distribution of marketable yields for PT hybrids exceeded that of the cultivars by 820 gm/plant. Significant general combining ability among 2x and 4x parents for total and marketable yield indicates that the potential of specific crosses can be predicted by average performance of parents in test crosses. Predictability of parental breeding value and exceptional yield potential of hybrids make 4x—2x breeding an attractive alternative to conventional approaches.

Effective development of 2x S. phureja parents with meiotic restitution requires insight into mechanisms associated with these abnormalities. Cytological disturbances resulting in unreduced pollen were examined in four clones of diploid (2n = 2x = 24) Solanum phureja Juz. and Buk.; two (148-17 and 127-14) were variable and two (154-1 and B2-11) were consistently high in unreduced pollen production. Three types of abnormal spindle orientation were observed at the second meiotic division: fused, tripolar and parallel spindles (fs, tps and ps, respectively). All four genotypes had fs. Three had tps, and ps was least frequent, occurring in two genotypes only. Cross-sections of buds revealed that all three abnormalities can occur in adjacent cells of a locule. In all genotypes, fs predominated at high levels of expression of unreduced gametes. At lower levels of expression (i.e., less than 60%, which occurred only in 148-17 and 127-14), however, the frequencies of tps and ps increased. In general, there was little evidence for localization of dyads (resulting from fs or ps) or tetrads (resulting from normal divisions) within cross-sections of locules, but 52.4 percent of all tetrads which occurred in a single locule of genotype 127-14 were found in 25 percent of the locular area. Cross-sections of buds revealed variation in frequency of unreduced gametes among anthers (61.7 vs 5.6 percent in 148-17) and between locules of an anther (73.1 vs 90.0 percent in B2-11).

For some years, we had observed differential responses of diploid and tetraploid potatoes to metribuzin. Tetraploid groups were relatively tolerant while diploid groups were relatively susceptible to metribuzin applied postemergence. Metribuzin uptake through the roots did not have any effect on either ploidy level. Foliar uptake of metribuzin killed diploid plants while tetraploid genotypes were not injured. However, differential retention of metribuzin does not seem to be the determining factor of its foliar uptake selectivity between potato ploidy levels. Tetraploid levels of potato might be producing the necessary biological systems required to inactivate the absorbed amount of metribuzin while the diploid level is incapable of doing likewise. Hence, it seems that the ploidy level in itself might be one of the factors influencing the response of potato plants to postemergence applications of metribuzin. This (i.e., differences in ploidy level) has not been considered as a factor in tolerance to herbicides in herbicide research.

Replicated Yield Trials

Yield trials were conducted at four locations: Grand Forks (Red River Valley), Becker and Big Lake (irrigated sands), and Grand Rapids (sandy loam). Trials at three other locations were severely stressed by drought conditions.

A total of 22 selections and 14 varieties were included in trials at Grand Forks (Table 1) and Becker (Table 2).

Minnesota Table 1. Replicated yield trial—1980, Grand Forks.

Variety	Color	Maturity[1]	Type[2]	Total Yield[3]	Marketable Yield[4]	Specific Gravity	Shape	1979 GF[5] Chipping 43F	65F
8743	Lt.Red	5.0	2.0	44.0	42.8	1.082	Blocky	-	-
Dakchip	White	4.0	4.0	40.3	39.4	1.084	Round	-	-
81962	Red	3.5	3.5	39.6	38.2	1.080	Blocky	26	37
Alaska Red	Red	5.0	1.5	36.8	36.1	1.084	Round	-	-
4536	Red	3.0	2.5	35.6	35.1	1.078	Blocky	25	34
Pontiac	Red	5.0	3.0	35.3	34.8	1.069	Blocky	20	28
10162	White	5.0	4.0	35.0	34.3	1.088	Long	41	51
Norland	Red	2.0	1.5	35.0	34.0	1.080	Round	30	38
8757	Red	5.0	3.0	34.2	33.6	1.075	Blocky	21	25
Norgold	Russet	3.5	2.0	34.8	33.5	1.075	Blocky	-	-
Crystal	White	5.0	1.0	33.7	33.2	1.079	Blocky	-	-
Kennebec	White	6.0	4.0	33.5	32.8	1.075	Long	-	-
Norchip	White	4.0	3.5	33.5	32.8	1.089	Round	41	48
Rosa	Pink eye	5.0	2.0	33.4	32.5	1.080	Round	-	-
9781	Russet	4.5	3.0	33.5	32.5	1.095	Long	40	43
9569	Russet	4.0	3.0	31.5	31.0	1.077	Long	32	38
8742	Red	4.0	2.0	31.9	30.9	1.082	Blocky	25	32
9234	White	5.5	2.5	31.4	30.2	1.081	Round	32	40
9862	White	4.5	3.5	31.0	30.0	1.090	Blocky	44	50
8224	White	5.0	3.0	30.5	29.5	1.094	Round	40	50
7973	White-Russet	4.5	3.0	29.4	28.9	1.071	Long	33	35
9885	White	4.5	2.5	28.8	28.3	1.086	Blocky	38	42
8758	Red	5.0	1.0	27.6	27.4	1.078	Blocky	25	34
Lemhi	Russet	5.5	2.5	28.5	26.8	1.079	Long	-	-
AK114	White	5.5	4.0	28.0	26.5	1.074	Round	-	-
9886	Russet	5.0	4.0	27.2	26.0	1.083	Long	31	36
9648	Russet	5.0	2.0	26.3	25.3	1.083	Blocky	37	41
Denali	White	6.0	2.5	25.1	24.6	1.101	Round	-	-
9319	Russet	5.5	3.0	24.9	24.4	1.087	Blocky	30	34
8586	Russet	4.0	2.0	26.0	23.9	1.089	Blocky	37	44
8777	Red	6.0	1.5	24.4	22.9	1.069	Round	21	33

(continued)

Minnesota Table 2 — continued.

Variety	Color	Maturity[1/]	Type[2/]	Total Yield[3/]	Marketable Yield[4/]	Specific Gravity	Shape	1979 GF[5/] Chipping 43F	65F
10267	Russet	5.5	2.5	21.4	20.7	1.074	Blocky	27	37
10049	White	6.0	3.0	21.3	20.5	1.082	Blocky	33	41
9984	White	3.0	2.0	21.1	19.9	1.091	Round	44	50
Alagash	Russet	2.0	3.5	18.8	18.2	1.087	Blocky	-	-
Burbank	Russet	6.0	4.5	15.9	15.5	1.078	Long	-	-

[1/] Scale, 1-6: 1, early; 6, late.

[2/] Scale, 1-5: 1, good; 5, poor.

[3/] Twenty hill plots, 12" between hills, 38" between rows.

[4/] LSD_{05} = 10.0.

[5/] Chip color values of 35 or more are acceptable.

Cooperator: Dennis Askim.

Planted: May 15, 1980.

Harvested: September 18, 1980.

Minnesota Table 2. Late harvested replicated yield trial—1980, Becker.

Variety	Color	Type[1/]	Total Yield[2/]	Marketable Yield[3/]	Specific Gravity	Shape
8743	Lt.Red	2.0	84.8	83.5	1.068	Blocky
Pontiac	Red	3.0	79.5	78.5	1.063	Blocky
8777	Red	1.5	77.0	76.0	1.067	Round
Lemhi	Russet	2.5	77.1	75.3	1.075	Long
10162	White	2.5	71.4	70.7	1.077	Blocky
Alaska Red	Red	2.0	71.8	70.0	1.067	Round
4536	Red	1.5	68.8	68.5	1.065	Blocky
Norgold	Russet	1.5	70.0	68.4	1.073	Blocky
Crystal	White	1.0	68.3	67.8	1.076	Blocky
81962	Red	3.0	68.0	67.3	1.073	Long
Denali	White	1.0	65.0	64.0	1.088	Round
AK114	White	3.5	66.4	63.6	1.069	Round
Kennebec	White	3.0	64.0	62.5	1.072	Long
8742	Red	1.5	62.8	62.3	1.076	Blocky
10049	White	2.0	63.0	62.0	1.070	Blocky
9885	White	2.5	62.3	61.8	1.082	Blocky
Rosa	Pink eye	2.0	63.7	61.6	1.073	Round
9234	White	2.0	62.5	61.0	1.071	Round
8757	Red	2.5	61.8	60.8	1.064	Blocky
Dakchip	White	3.0	61.3	60.5	1.067	Round
Burbank	Russet	4.0	59.8	59.2	1.077	Long
9648	Russet	2.0	59.4	58.8	1.077	Blocky
10267	Russet	2.0	58.5	57.5	1.071	Blocky
7973	White-Russet	2.5	56.1	55.5	1.067	Long
9862	White	2.0	56.5	55.0	1.077	Blocky
9319	Russet	2.5	55.5	54.0	1.077	Blocky
9781	Russet	3.0	55.0	54.0	1.075	Long
8758	Red	1.5	54.6	53.8	1.069	Blocky
Norland	Red	2.0	54.5	53.3	1.064	Round
Norchip	White	3.0	53.5	53.0	1.071	Round
9886	Russet	2.5	52.3	51.8	1.071	Long
9984	White	2.0	50.8	50.5	1.080	Round
9569	Russet	2.5	51.0	50.0	1.067	Long
8224	White	3.0	50.8	59.8	1.080	Round
8586	Russet	2.0	50.0	47.5	1.070	Blocky
Alagash	Russet	2.0	46.0	45.5	1.064	Long

[1/] Scale, 1-5: 1, good; 5, poor.
[2/] Twenty hill plots, 12" between hills, 42" between rows.
[3/] LSD_{05} = 15.5.

Cooperator: Glenn Titrud.
Planted: May 17, 1980
Harvested: August 26, 1980.

NEBRASKA

R. B. O'Keefe and Eric D. Kerr

Improvement of Potatoes as a Food and Energy Resource

The project was revised to include the development of varieties and production methods for utilizing the potato as an alcohol source. Yields of 500 to 700 cwt/acre and 640 to 811 gal/acre of ethanol were obtained with the varieties Red Pontiac, Kennebec and Progress and the selections A503-42, Neb 40S.72-2, Neb 40.57-3 and Neb A42.72-1 (Nebraska Tables 1-4). The study is cooperative with the states of Washington, Idaho, North Dakota and Maine (see report by Dr. Mark Martin).

Variety Screening Trials

The cooperative program to develop white chipping varieties was continued in Nebraska, Wyoming and Colorado. The selections Wisc 726, Minn 7973, Neb A219.70-3, Neb 7.76-1 and WC 612-13 are being increased for commercial evaluation. Selections that have potential for the fresh market include the red skinned cultivars Wisc 729R, Minn 4536 and Neb A143.70-2; the russets are Neb A63.71-1, Neb 12.72-2, Neb A69.72-1. Commercial and replicated trials were continued in cooperation with the University of Arizona at the Mesa Experiment Station. The promising selections and varieties are: Chipping-Atlantic, Denali, Neb S1-3, Wisc 726; reds-Neb A143.70-2, Wisc 729R, russets-Neb A63.71-1, Neb A71.72-1.

The investigation of greenhouse indexing using laboratory methods to detect diseases in seed stocks was initiated with the cooperation of Horticulture and Plant Pathology in Lincoln.

Early Blight Control

Results of studies of the effectiveness of the application of fungicides through center-pivot systems in 1978 and 1979 were indicative of the potential control of early blight on potatoes by this method. The studies were repeated and expanded in 1980 to include Bravo and Difolatan applied through the center-pivot system and with one to six applications at 10 day intervals beginning in late June. Early blight intensity was retarded on vines with four to six applications. No yield increases were obtained with fungicide applications in 1980. However, early blight was not as severe in 1980 as in 1979 when yield increases resulted from fungicide applications. Dr. Eric Kerr, Pathologist at the UNL Panhandle Station is cooperating in the study.

Processing Studies

Samples of four standard potato varieties and 13 advanced selections were obtained from 14 locations in the North Central Region and Canada in 1979. The samples were analyzed for sucrose (SR rating), glucose and chip color within one month of harvest and after three and six months of 50° F storage. Protein contents of tubers were also determined.

The relationship of sucrose content (SR rating) at harvest time to long-time chipability was studied for the third year. The average sucrose content of the cultivars ranged from 1.85 to 3.56 mg/g which was similar to the ranges in 1977 and 1978 (Nebraska Table 5). However the average color of chips after three and six months of storage in 1978 and 1979 was not correlated with average SR rating nor was SR rating correlated with vine maturity. SR ratings were correlated with long-time storage chip colors in 1977. Glucose contents after long-time storage were not correlated with SR ratings nor vine maturity but were highly correlated with chip color after six months storage ($r = 0.877$).

Protein contents of tubers ranged from 3.33 to 5.03 percent and was not correlated with SR rating or vine maturity.

The average sucrose contents (SR ratings) of samples from various locations ranged from 1.54 to 6.80 mg/g and exceeded the ranges for 1977 and 1978 (Nebraska Table 6). Samples received from Minnesota and Kansas had been produced under stress conditions and were immature with high SR ratings. Average chip color of samples after three and six months 50^{o} F storage were not correlated with average SR ratings at harvest nor with glucose contents ($r = 0.234$). Sucrose contents at harvest were not correlated with length of growing season. Average protein contents of samples ranged from 3.34 to 5.32 percent and was not correlated with length of growing season.

Seven cultivars were common to eight locations for three years and eight cultivars in two years. The correlation between average SR ratings and average chip color after long-time storage were high among the cultivars in 1977 ($r = 0.959$) but not in 1978 and 1979. Chip color after long-time storage was highly correlated with glucose content of tubers in all years with r-values of 0.950, 0.907 and 0.964 for 1977, 1978 and 1979 respectively,

Average values for vine maturity, sucrose content, chip color after one, three and six months of storage and glucose and protein contents of tubers were highly correlated for individual cultivars (genotypes) in 1978 and 1979 (Nebraska Table 7 Correlations for locations (environments) were significant only for glucose and protein contents after six months of storage. The data suggest that the repeatability of genotypes over a wide range of environments was high for the two years while environmental variations within specific locations for the two years had a variable effect (interaction) on genotypes. For this reason, six years of similar data have been programmed for analyses to determine SR rating - PCII color relationships for individual genotypes within and among years and locations. The data will also provide estimates of the repeatability of a genotype within an environment (location over years) for all factors studied.

Correlations of yield and quality factors with climatic conditions and cultural practices will be provided. The climatic conditions include maximum, minimum average and departure from normal temperatures and growing degree days. The cultural factors of fertilizer levels and plant spacing will be considered.

Three years of data for glycoalkaloid content of tuber samples from various locations are being summarized.

Nebraska Table 1. Ethanol and stillage from potatoes grown at Scottsbluff, Nebraska 1980.

Variety	Cwt./A	Sp.Gravity	% Carbohydrate 1/	Ethanol Gal./A. 2/	Stillage lbs./A. 3/
A503-42	507	1.093	17.0	665	7605
Kennebec	544	1.083	15.7	655	7426
Red Pontiac	564	1.073	14.9	646	6796
Bounty	491	1.085	15.8	597	6874
WC 612-13	429	1.090	16.8	553	6220
B 8977-2	408	1.087	16.0	503	5834
Neb S1-3	340	1.089	16.8	440	4862
Lemhi	313	1.099	18.0	434	4914
Neb 12-72-2	347	1.084	15.9	425	4771
Crystal	355	1.083	15.4	422	4863
Neb A210-2	354	1.071	14.5	395	4195
Neb A129.69-1	313	1.084	16.0	385	4288
B 6987-201	257	1.099	17.6	348	4086
B 8934-4	249	1.098	17.4	334	3934
B 7583-6	273	1.082	15.6	328	3685
RB-307	210	1.085	16.0	258	2919
B 8943-4	187	1.089	16.5	238	2702
B 8972-2	106	1.077	14.6	119	1378

1/ Based on starch as a percentage of total solids plus sucrose and reducing sugars as determined by the modified Hassid method.

2/ Ethanol as 50 percent of the total fermentable carbohydrates divided by 6.6 (weight/gal.).

3/ Stillage wastes (feed) as 50 percent of total carbohydrates plus other solids (protein, cellulose, etc.).

Nebraska Table 2. Acre value and costs of ethanol production from potatoes, Scottsbluff, Nebraska 1980.

Variety	Value $1.70/Gal.	1/ Cost Per Gal.	2/ Net Value
A-503-42	$1130	0.92	$520
Kennebec	1113	0.93	503
Red Pontiac	1098	0.94	488
Bounty	1015	1.02	405
WC 612-13	940	1.10	330
B 8977-2	855	1.21	245
Neb S1-3	748	1.39	138
Lemhi	738	1.41	128
Neb 12-72-2	722	1.44	112
Crystal	717	1.45	107
Neb A210-2	671	1.54	61
Neb A129-69-1	654	1.58	44
B 6987-201	592	1.75	- 18
B 8934-4	568	1.83	- 42
B 7583-6	558	1.86	- 52
RB - 307	434	2.36	-176
B 8943-4	404	2.56	-206
B 8972-2	202	5.13	-408

1/ Gallons/Acre divided by cost/A. ($610).

2/ Value/Acre minus cost/A.

Nebraska Table 3. Ethanol and stillage from advanced potato selections and varieties, Scottsbluff, Nebraska 1980.

Variety	Cwt/A	Sp Gravity	% Carbohydrate 1/	Ethanol Gal./A 2/	Stillage lbs./A 3/
40S.72-2	624	1.093	16.9	811	9391
40.57-3	700	1.078	15.0	805	9100
PI5.72-2	544	1.085	16.1	675	7534
A42.72-1	574	1.080	15.2	672	7634
Progress	520	1.085	16.0	640	7228
Onaway	560	1.075	14.8	638	6944
D17.63-1	512	1.085	16.0	630	7117
Platte	520	1.082	15.4	614	7072
A158.70-2	538	1.074	14.5	603	6698
90S.72-3	472	1.091	16.5	599	7009
17.66-1	580	1.069	13.4	597	6960
Katahdin	486	1.083	15.7	588	6634
A86.72-3	544	1.070	13.9	582	6446
43S.72-2	500	1.076	15.1	580	6275
Triumph	486	1.078	14.9	559	6294
199.57-2	480	1.078	15.0	557	6192
14.72-1	464	1.081	15.2	543	6264
LaRouge	454	1.079	15.1	527	5970
12.72-1	446	1.076	14.9	513	5597
A76.72-2	468	1.074	14.2	510	5897
92S.72-1	406	1.087	16.0	499	5806
Neb 153	402	1.083	16.1	498	5407
Denali	378	1.094	17.0	495	5746
A234-1	402	1.074	15.0	462	4904
16.72-1	402	1.078	14.8	458	5266
A86.72-2	446	1.065	13.2	450	5040
Neb 154	362	1.087	15.9	442	5195
Neb 133	420	1.065	13.5	437	4641
8.72-2	364	1.085	15.6	437	5132
A72-3	388	1.069	13.7	407	4598
9.72-3	330	1.084	15.8	403	4554
Sebago	342	1.078	14.7	386	4463
A210-1	348	1.070	14.1	376	4124
Neb 140	304	1.073	15.0	350	3648
A77.72-1	356	1.059	12.0	328	3774
74B.57-5	302	1.070	13.7	317	3639

1/ Based on starch as a percentage of total solids plus surcrose and reducing sugars as determined by the modified Hassid method.

2/ Ethanol as 50 percent of the total fermentable carbohydrates divided by 6.6 (weight/gal.).

3/ Stillage wastes (feed) as 50 percent of total carbohydrates plus other solids (protein, cellulose, etc.).

Nebraska Table 4. Acre value and costs of ethanol production from advanced potato selections and varieties, Scottsbluff, Nebraska 1980.

Variety	Value $1.70/Gal.	1/ Cost Per Gal.	2/ Net Value
40S.72-2	$1379	0.75	$769
40.57-3	1369	0.75	759
PI5.72-2	1148	0.90	538
A42.72-1	1142	0.91	532
Progress	1088	0.95	478
Onaway	1085	0.96	475
D17.63-1	1071	0.97	461
Platte	1044	0.99	434
A158.70-2	1025	1.01	415
90S.72-3	1018	1.02	408
17.66-1	1015	1.02	405
Katahdin	1000	1.04	390
A86.72-3	989	1.05	379
43S.72-2	986	1.05	376
Triumph	950	1.09	340
199.57-2	947	1.10	337
14.72-1	923	1.12	313
LaRouge	896	1.16	286
12.72-1	872	1.19	262
A76.72-2	867	1.20	257
92S.72-1	848	1.22	238
Neb 153	847	1.22	237
Denali	842	1.23	232
A234-1	785	1.32	175
16.72-1	779	1.33	169
A86.72-2	765	1.36	155
Neb 154	751	1.38	141
Neb 133	743	1.40	133
8.72-2	743	1.40	133
A72-3	692	1.50	82
9.72-3	685	1.51	75
Sebago	656	1.58	46
A210-1	639	1.62	29
Neb 140	595	1.74	-15
A77.72-1	558	1.86	-52
74B.57-5	539	1.92	-71

1/ Gallons/Acre divided by cost/A. ($610).

2/ Value/Acre minus cost/A.

Nebraska Table 5. Chip color sugar and protein contents of potatoes in the NCS trials 1979.

Selection	Vine Maturity	Sucrose (1)**	PCII* (1)**	PCII* (3)[1/]	PCII* (6)	Glucose (6)	Protein
		mg/g	Averages for 14 locations			(%)[2/]	(%)[3/]
Red Pontiac	3.6	3.56	5.6	7.4	7.5	.77	4.65
LA 42-38	4.0	3.39	3.7	5.6	5.3	.41	4.71
Minn 8777	3.9	3.33	4.7	6.2	5.7	.37	3.77
Wisc HS-17	2.7	3.29	3.1	4.2	4.0	.19	4.74
Minn 8224	2.9	3.01	2.3	3.9	4.7	.29	4.49
Neb A129.69-1	4.2	2.90	4.8	4.5	7.0	.30	4.73
Neb S1-3	4.1	2.84	6.2	7.2	6.9	.53	3.33
Minn 9648	2.6	2.80	2.6	3.8	4.1	.25	4.61
ND 137-2 Rus	2.4	2.76	5.5	6.6	7.3	.49	4.45
Norchip	2.7	2.76	2.5	3.2	3.1	.15	4.47
Rus Burbank	4.2	2.69	3.8	5.7	5.5	.39	3.81
AK 38-2	4.3	2.64	2.5	3.3	3.3	.15	4.23
Wisc 723	3.2	2.54	2.8	4.0	4.0	.22	5.03
ND 146-4R	1.3	2.39	2.0	4.6	4.7	.32	4.36
Wisc 738	3.7	2.33	3.0	4.6	5.6	.39	4.59
Norland	1.4	2.14	4.0	6.7	6.8	.51	4.47
Neb A69.72-1	3.8	1.85	5.5	6.2	7.0	.55	4.46
Mean:	3.2	2.78	3.8	5.2	5.0	.37	4.41
Correlation with Sucrose:	0.2773	----	0.1157	0.083	0.031	0.000	0.0100

* PCII Chip Color = 1 to 10 scale.
** Number in parentheses = approximate number months after harvest.
1/ Treated with Fusarex.
2/ Correlation with Maturity = 0.282; Correlation with PCII (6) = 0.877**
3/ Correlation with Maturity = 0.287

Nebraska Table 6. Chip color sugar and protein contents from various locations 1979.

Selection	Harvest Date	Sucrose (1)**	PCII* (1)**	PCII* (3)1/	PCII* (6)	Glucose (6)	Protein
		mg/g	Averages for 17 selections			%	%
Minnesota	8/28	6.8	1.0	5.7	4.8	.44	4.92
Kansas	8/7	6.14	3.7	4.4	6.0	.56	4.96
Missouri	8/22	4.26	2.8	5.4	5.4	.61	4.17
Alberta	9/17	2.86	3.9	4.6	4.7	.23	4.80
North Dakota	9/17	2.69	6.0	5.8	6.1	.42	----
Wisconsin	9/24	2.5	4.0	5.5	4.2	.36	5.03
Iowa	8/7	2.31	6.2	7.1	6.8	.59	4.62
Colorado	9/15	2.16	2.7	4.4	5.2	.25	3.51
Nebraska	9/18	2.13	4.1	4.7	4.5	.79	3.34
Ohio	9/20	2.03	2.3	4.4	3.8	.29	4.87
South Dakota	9/18	1.85	3.6	4.8	5.4	.28	5.32
Michigan	9/27	1.80	2.6	---	---	---	4.88
Manitoba	9/26	1.54	6.3	5.8	6.2	.36	4.80
Indianna	10/17	----	2.9	4.5	5.1	.21	4.38
Mean:		3.01	3.7	5.2	5.2	.41	4.58

* PCII Chip color = 1 to 10 scale.

** Numbers in parentheses = approximate number of months after harvest.

1/ Treated with Fusarex.

Nebraska Table 7. Correlations between years 1978 and 1979 for 8 selections and 9 locations.

	Selections	Locations
Vine Maturity	0.9887**	------
Sucrose (SR)	0.7805**	0.2092
PCII (1)[1/]	0.9387**	0.5405
PCII (3)	0.8401**	0.4770
PCII (6)	0.9297**	0.2886
Glucose (6)	0.8440**	0.8915**
Protein	0.6950*	0.9369**

1/ Numbers in parentheses equal months after harvest.

New Jersey 1980

Melvin R. Henninger

Potato Variety Evaluation

Exp No.	Rows	Size	Reps	Dates		Soil Texture
				Planting	Harvesting	
1	Single	12' long x 3' wide	1	4/17	8/11-12	loamy sand
2	Single	12' long x 3' wide	1	4/22	8/18	loam
3	Single	12' long x 3' wide	4	4/22	8/18	loam
4	Double	12' long x 3' wide	4	5/5	8/28	loam
5	Single	21' long x 3' wide	4	4/22	8/20	loam
6	Single	21' long x 3' wide	6	4/22	8/18	loam
7	Double	12' long x 3' wide	4	4/29	9/29	sandy loam

Commercial cultural practices were used on all experiments, irrigation supplemented natural rainfall. Specific gravities were determined by the air and water method.

Key to Rating System

Air Pollution: 1 = plants are dead; 2,3,4 = increasing plant appearance with varying degrees of defoliation; 5 = most leaves having speckling or bronzing, but general appearance is good; 6,7,8 = good plant conditions with decreasing foliar symptoms; 9 = none.

Maturity: 1 = v. early, 5 = medium, 9 = v. late.

Tuber Color: 1 = purple, 2 = red, 3 = pink, 4 = dk. brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = bright white.

Tuber Texture: 1 = part rus., 2 = heavy rus., 3 = mod. rus., 4 = light rus., 5 = net, 6 - sl. net, 7 = mod. smooth, 8 = smooth, 9 = v. smooth.

Tuber Shape: 1 = round, 2 = most rd., 3 = rd. to oblong, 4 = most obl., 5 = obl., 6 = most obl., 7 = obl. to long, 8 = most long, 9 = long.

Tuber Depth: 1 = v. flat, 5 = ok depth, 9 = excellent depth.

Tuber Conformation* & Field Rating*: 1 = v. poor, 5 = fair, 9 = excellent.

Eye Depth: 1 = v. deep, 5 = medium, 9 = v. shallow.

Second Growth*, Growth Crack*, Hollow Heart*, Int. Necrosis*, Heat Sprout*: 1 = very severe, 3 = severe, 5 = moderate, 7 = slight, 9 = none.

Chip Color: First value is 3 days after harvest, second value a week later, etc. 1 = v. light, 5 = borderline, 8 = v. dark.

*Seven or above is considered acceptable.

New Jersey Table. A summary of seven variety trials grown at four locations in New Jersey, 1980.

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	% ↑ 1-7/8"	% ↑ 2-1/2"	Field Rating	Chip Color
4	B6969- 2	6	2	9	9	1	8	8	8	9	9	9	9	9	333	49	97	72	9	
5	B6969- 2	4	2	8	8	1	8	8	7	8	9	7	8	8	420	59	95	73	7	
6	B6969- 2	5	1	8	8	1	9	7	8	8	7	9	9	9	404	57	95	67	7	
4	B6987-184	7	5	7	8	4	6	7	8	8	9	7	9	9	394	75	95	58	7	
6	B6987-184	4	2	7	7	3	5	6	8	8	9	8	9	9	377	83	93	60	6	23
7	B7583- 6	8		4	4	6	6	7	8	8	7	9	9		346	69	74	18	6	
6	B8091- 8	6	3	8	7	2	7	7	6	7	8	8	9	9	471	74	96	75	8	
6	B8503- 13	7	4	7	8	2	5	6	5	8	8	9	9	9	458	64	96	74	6	55
4	B8599- 42	7	2	7	6	2	8	8	7	9	9	8	9	9	384	43	97	78	8	
6	B8599- 42	5	4	7	6	2	9	7	8	8	6	7	9	9	358	56	96	78	7	45
4	B8615- 2	7	3	8	8	2	8	8	7	5	9	9	9	9	376	62	95	66	8	
6	B8615- 2	6	4	7	7	2	6	6	6	6	9	9	9	9	426	73	95	73	7	
3	B8706- 7	6	5	7	7	2	7	7	5	6	7	7	7	9	529	65	95	74	6	33
6	B8724- 2	6	4	7	5	3	7	7	7	8	6	7	7	9	496	70	96	65	7	56
6	B8757- 7	6	4	9	9	2	8	7	8	8	8	8	9	9	450	70	95	70	8	43
3	B8798- 20	6	4	8	8	2	8	8	7	9	9	8	9	8	491	72	96	73	8	22
6	B8799- 13	6	4	7	8	3	6	7	7	8	9	7	7	9	374	77	94	68	7	12
6	B8907- 4	5	4	7	5	3	8	8	7	8	9	7	9	9	334	65	96	78	8	15
7	B8972- 1	6		5	5	8	7	7	8	8	6	8	9		360	69	83	34	7	
6	B9018- 12	7	5	8	8	2	6	7	8	7	9	9	9	9	550	68	96	74	8	32
3	B9130- 24	5	4	7	5	2	7	8	6	6	9	8	9	7	568	67	91	40	8	45
3	B9140- 4	4	3	7	5	3	8	8	8	8	7	7	9	9	466	72	95	55	8	13
3	B9140- 6	3	2	7	6	2	6	5	4	9	4	7	7	9	300	57	95	77	4	
3	B9140- 14	5	3	7	7	2	8	8	8	9	9	8	7	9	466	66	92	60	7	21
3	B9148- 5	2	1	8	8	2	6	7	6	9	9	8	9	9	396	65	95	62	7	44
3	B9192- 1	4	4	6	6	2	6	8	7	7	9	9	6	9	420	62	98	80	5	24
3	B9224- 6	5	3	8	8	3	7	6	5	9	9	9	8	8	486	66	94	67	6	45
3	B9311- 7	4	2	7	7	2	7	8	7	7	6	8	8	9	447	71	93	59	7	
4	AF092- 3	8	4	8	7	6	7	6	4	7	6	9	9	9	490	55	94	58	6	
4	AF186- 5	8	8	8	8	3	6	7	8	8	8	9	9	9	405	60	92	46	7	
5	AF186- 5	7	5	8	7	4	5	6	8	8	7	8	9	7	482	68	94	60	6	
4	AF205- 9	7	5	8	8	3	7	7	8	7	9	9	9	8	420	66	92	42	7	
5	AF205- 9	7	4	8	8	4	7	7	8	9	9	9	9	9	425	73	92	46	7	
4	AF236-66	8	4	8	8	6	6	5	7	6	9	9	9	8	376	57	89	32	6	
5	AF238-21	5	3	9	9	4	5	7	6	9	9	7	9	8	442	67	94	47	6	
4	AK24- 3	8	8	9	9	2	6	6	8	6	9	9	9	3	159	57	89	44	4	
5	AS201- 4	7	5	8	8	3	6	7	8	8	7	9	9	8	394	67	95	62	6	
5	AS201-10	4	4	8	8	2	6	8	9	8	9	8	7	7	401	61	94	58	8	
5	AS201-10	7	5	8	8	2	8	8	8	9	9	8	9	9	360	60	94	73	7	
5	AS313-10	5	2	8	8	2	7	5	5	6	7	9	9	6	122	54	74	22	4	
5	AS313-10	4	4	8	8	3	7	5	6	9	7	9	9	5	100	46	77	25	4	
4	A68678-1	8	9	4	3	8	6	6	8	7	6	9	9	9	355	70	90	28	6	
7	A68678-1	8	9	5	4	8	7	7	6	6	7	9	9		340	71	80	16	7	
4	BR5991WV16	8	9	9	9	2	8	7	8	6	7	9	6	4	435	65	93	60	5	
4	BR7088-18	7	4	8	8	2	6	8	6	7	8	9	9	9	397	59	97	62	7	
5	BR7088-18	6	4	8	7	2	8	8	8	7	9	9	9	6	474	70	95	66	7	
4	BR7093-23	8	5	8	8	2	7	8	8	9	9	9	9	9	431	52	96	64	7	
5	BR7093-23	7	6	9	9	2	7	7	7	8	8	7	9	8	458	64	95	74	8	
4	CC026- 1A	7	4	8	8	3	7	7	7	7	9	8	9	9	460	59	96	70	7	
4	CF73058-14	7	4	8	7	3	6	8	8	7	8	9	9	9	408	58	96	67	8	

New Jersey Table. Continued...

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	% ↑ 1-7/8"	% ↑ 2-1/2"	Field Rating	Chip Color
5	CF73058-14	7	4	8	7	4	6	7	6	7	9	8	9	9	532	68	97	75	7	
4	CF73058-26	7	4	7	7	3	7	8	8	8	9	9	9	9	460	54	97	69	7	
5	CS72012- 4	7	7	8	8	6	7	5	7	6	9	9	9	9	103	48	80	33	5	
5	CS72018-11	7	4	7	6	2	8	8	8	9	9	7	8	7	388	76	91	48	8	
5	CS72018-11	5	2	7	6	2	6	7	7	8	9	6	9	6	365	72	91	38	6	
4	CS72032- 4	7	2	9	9	2	6	7	7	7	9	9	9	9	354	59	95	66	6	
5	CS72032- 4	7	4	8	8	3	5	5	7	7	9	8	9	9	437	63	96	77	6	
5	CS73107- 8	6	3	8	8	2	8	8	8	9	9	9	9	9	341	64	92	50	7	
5	CS73107- 8	8	8	8	8	1	8	8	8	7	9	9	9	7	513	57	93	70	9	
5	CS73132- 2	6	4	9	8	2	8	9	8	8	9	8	8	9	552	68	96	73	9	
5	CS73132- 2	7	5	8	7	2	7	8	8	8	8	9	8	9	488	62	93	69	8	
5	CS74089- 9	4	3	7	8	2	5	7	7	9	9	8	9	9	350	75	94	60	7	
5	CS74089- 9	5	5	9	9	2	8	7	8	8	7	9	9	9	330	74	96	67	8	
5	CS74090- 2	3	1	9	9	4	6	8	8	9	9	9	9	9	331	64	90	29	7	
5	CS74109- 8	7	5	8	7	5	7	7	7	6	7	7	9	9	527	51	95	67	6	
5	CS75003- 2	7	3	9	8	3	7	5	7	6	9	9	6	9	522	71	96	78	5	
5	CS75003-13	8	6	8	8	3	5	7	5	5	9	9	9	9	351	59	97	75	7	
5	CS75047- 4	7	4	5	4	5	6	5	7	6	6	7	9	9	394	62	87	39	4	
5	CS75091- 6	4	4	6	6	3	6	8	8	9	9	7	9	9	435	72	90	55	8	
5	CS75098- 1	6	3	5	3	4	7	6	7	9	9	9	8	9	319	58	95	71	7	
5	CS75106- 2	8	4	7	7	6	6	5	8	6	9	9	9	5	392	52	86	33	4	
5	CS76022- 8	6	1	9	9	3	7	7	8	9	9	9	9	9	333	55	91	51	7	
5	CS76038-22	7	2	9	9	2	4	5	5	9	9	9	9	9	94	60	96	75	5	
5	CS76039- 1	8	6	8	7	4	8	6	7	6	6	9	9	9	453	60	94	70	6	
5	CS76085- 5	3	1	7	7	2	7	6	9	9	9	9	9	9	219	54	93	64	6	
5	CS76085- 6	8	4	7	8	4	6	5	7	5	7	8	9	6	508	57	93	62	5	
5	CS76093- 2	5	3	9	9	3	8	5	4	9	7	9	9	9	391	60	97	79	5	
4	F67036	8	7	7	7	5	7	6	7	6	9	9	9	4	333	41	94	51	6	
4	F69016	7	7	8	8	6	5	5	7	6	9	9	9	4	287	66	90	41	5	
4	F69026	7	2	1	8	5	6	6	3	8	7	9	9	9	473	58	95	65	5	
5	NY-61	8	6	8	8	2	6	7	5	9	9	8	9	9	570	63	87	47	7	
5	NY-63	6	6	9	8	1	8	8	9	8	9	9	6	8	444	56	94	70	8	
5	NY-66	8	6	6	7	2	6	7	6	9	9	9	7	9	519	67	97	80	9	
5	Q 54- 6	8	7	9	9	2	6	6	8	9	9	9	9	5	351	58	94	62	6	
5	Q 54-11	6	3	9	9	3	7	7	6	8	9	9	9	9	471	71	96	70	8	
5	Q155- 3	5	3	9	9	2	5	6	7	9	8	8	9	9	459	61	96	75	7	
7	W564-3A	8		6	5	8	7	6	4	8	7	9	9		495	63	78	17	6	
4	W718	8	7	8	8	2	7	8	7	9	6	9	7	8	524	55	96	72	8	
7	ALLAGASH R	4		4	4	5	7	6	7	7	6	7	9		315	69	79	23	6	
3	ATLANTIC	6	5	7	6	1	9	8	9	9	9	6	3	9	529	77	95	70	4	
6	ATLANTIC	6	5	7	7	1	9	7	9	8	9	6	4	9	453	79	93	67	7	
4	BELCHIP	8	6	8	8	3	3	5	7	8	9	9	9	9	450	64	96	72	6	
5	BELCHIP	8	6	8	8	2	2	3	6	8	9	9	9	9	471	74	96	76	5	
6	BELCHIP	6	5	8	8	2	2	4	8	8	8	9	9	9	537	69	98	86	5	14
4	BELRUS	8	1	4	2	8	7	8	7	9	9	9	9	9	286	63	92	26	8	
6	BELRUS	5	3	4	2	8	6	8	9	8	8			9	291	70	73	22	7	33
7	BELRUS	6		4	2	8	6	8	9	8	9	7	9		295	73	83	16	8	
7	BELRUS	6		4	2	8	5	8	8	7	9	8	9		255	73	83	19	7	
7	BUTTE	8		7	6	8	7	4	3	6	9	9	9		266	75	61	14	3	
4	CAMPBEL-11	7	3	7	8	2	6	8	7	7	9	9	9	9	382	61	97	78	8	

New Jersey Table. Continued...

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	%↑1-7/8"	%↑2-1/2"	Field Rating	Chip Color
5	CAMPBEL-11	7	4	7	8	2	6	8	7	8	8	8	9	9	423	71	96	73	8	
4	CROATAN	7	4	8	8	2	8	6	4	4	8	9	9	7	392	44	90	46	5	
4	DENALI	7	5	9	9	1	8	8	8	7	9	8	9	8	400	66	95	60	8	
5	DENALI	8	7	9	8	2	7	7	7	6	9	9	9	6	442	77	93	63	6	
4	HUDSON	8	6	8	8	2	7	7	6	8	9	9	8	9	315	54	95	68	7	
5	HUDSON	8	7	8	8	2	6	6	6	7	9	9	9	9	459	71	97	79	6	
4	JEMSEQ	7	3	7	8	3	6	7	8	9	5	8	9	9	422	58	97	84	6	
4	KATAHDIN	7	8	8	8	2	6	8	9	9	9	9	9	9	351	39	93	57	8	
5	KATAHDIN	7	7	8	8	2	6	7	8	8	9	9	8	9	464	51	91	61	7	
6	KATAHDIN	7	5	8	8	2	6	7	8	8	9	9	8	9	466	60	94	67	7	65
7	KATAHDIN	7		8	8	8	6	7	7	9	9	9	9		433	59	89	57	7	
7	NOR RUSSET	6		7	6	4	6	5	5	6	8	9	9		332	64	82	34	4	
3	NORCHIP	4	4	8	9	2	6	6	6	7	8	9	7	8	536	64	92	55	6	
4	NORCHIP	7	4	8	8	2	6	6	5	9	9	9	8	9	422	62	95	60	6	
5	NORCHIP	5	4	9	8	2	6	6	5	6	6	9	9	7	468	67	94	59	5	
6	NORCHIP	5	4	8	8	2	6	5	6	8	5	9	7	9	500	69	96	66	6	23
3	ONTARIO	7	6	9	9	2	6	5	4	4	9	9	9	7	494	61	89	58	5	
5	PENN 71	7	5	9	9	2	3	5	6	9	9	8	9	9	448	67	94	67	5	
7	R BURBANK	8	9	7	6	9	9	2	4	1	7	7	9		414	69	85	40	2	
3	SUPERIOR	5	3	7	6	3	7	7	5	6	9	9	9	7	478	63	97	76	7	
4	SUPERIOR	8	4	7	7	3	6	7	6	7	9	9	9	9	437	50	95	57	7	
5	SUPERIOR	4	3	7	6	3	6	6	5	7	9	9	9	7	418	65	95	68	6	
6	SUPERIOR	6	5	7	6	3	6	7	4	8	7	9	9	7	427	64	96	68	7	
7	SUPERIOR	7	5	7	7	3	8	9	5	7	7	9	9		434	67	88	58	6	
1	B6969- 2	2	0	8	8	2	8	7	8	9	7	9	9		363	64	93	49	7	32
1	B6987-184	2	7	8	7	4	6	7	8	9	7	7	9		302	85	91	50	6	51
1	B7583- 6	2	8	4	5	6	3	6	9	9	9	9	9		260	78	94	60	6	66
2	B7583- 6	6	5	5	3	4	7	6	8	6	9	9	9	7	434	72	93	51	6	57
1	B8091- 8	3	1	8	8	2	7	5	8	9	9	6	9		360		93	71	6	
1	B8503- 13	2	5	8	9	2	7	7	8	9	9	9	9		526	73	94	68	7	43
1	B8599- 42	3	6	8	7	2	8	7	9	9	9	8	9		450	65	97	88	8	32
1	B8615- 2	2	2	8	7	2	6	7	8	9	9	9	6		353		92	74	3	
1	B8706- 7	7	9	8	7	2	8	7	8	8	9	8	8	8	540	65	95	84	8	33
1	B8710- 1	4	6	8	9	4	2	5	8	9	4	9	9		514		92	64	5	
2	B8710- 1	3	2	8	8	5	5	5	5	9	9	9	9	9	415	68	92	64	5	
1	B8724- 2	2	6	6	7	3	6	6	8	9	5	9	9		578	67	96	67	6	56
1	B8757- 7	4	8	9	9	2	6	7	9	9	9	7	9		411	73	96	77	8	22
1	B8798- 20	6	9	8	8	2	7	7	8	9	9	9	9		430	71	95	56	7	22
1	B8799- 13	5	7	7	8	3	8	6	8	9	8	8	9		415	73	90	33	7	22
1	B8833- 6	2	0	6	8	3	6	7	8	9	7	9	9		249		83	321		
2	B8833- 6	4	2	5	4	7	7	6	7	7	6	9	9	7	361	65	79	47	6	
1	B8907- 4	5	9	8	6	2	9	7	8	9	9	8	9		292	65	97	70	7	22
1	B8934- 4	3	4	5	4	6	7	4	8	4	9	8	9		366		95	74	5	
2	B8934- 4	7	5	5	4	3	7	6	6	6	9	9	9	6	451		95	57	6	
1	B8943- 4	5	0	5	4	8	6	6	8	8	7	7	9		439		93	44	7	
2	B8943- 4	4	3	5	4	8	6	6	7	5	8	9	9	9	510	67	94	51	7	
1	B8972- 1	4	1	5	4	7	7	6	8	9	9	9	9		333	68	92	54	6	32
1	B9018- 12	3	7	8	8	2	8	7	7	9	9	9	9		644	69	95	80	8	22
1	B9127- 1	5	1	8	8	3	7	9	7	9	9	9	9		356	63	97	66	9	56
2	B9127- 1	7	5	7	7	2	7	7	5	7	9	9	9	9	647	61	96	88	8	

New Jersey Table. Continued...

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	% ↑1-7/8"	% ↑2-1/2"	Field Rating	Chip Color
1	B9127- 6	2	3	8	6	2	8	7	7	9	7	9	9		319	53	98	57	7	55
2	B9127- 6	5	6	8	7	4	7	8	6	9	9	9	9	7	671	54	97	82	9	65
1	B9127- 17	4	7	8	6	2	8	8	8	9	9	8	7		361	73	93	51	8	66
2	B9127- 17	8	3	8	7	2	9	8	5	9	9	9	9	9	527	78	97	85	8	66
1	B9130- 24	2	6	8	7	2	7	8	9	9	9	9	9		326	78	72	7	7	34
1	B9130- 39	4	0	8	8	1	8	8	9	9	9	9	9		124		81	17	5	
1	B9137- 9	2	3	5	4	6	7	6	9	9	9	9	9		382	63	89	27	7	14
1	B9140- 4	1	1	7	6	2	8	8	9	9	9	9	9		398	79	89	16	7	33
1	B9140- 6	3	2	8	9	2	8	6	8	9	6	9	9		255		97	76	6	
1	B9140- 14	2	2	8	9	1	8	9	9	9	9	9	9	9	393	73	93	43	9	33
1	B9140- 17	3	6	8	9	2	8	8	9	9	9	8	9		360	75	92	61	8	32
2	B9140- 17	7	2	8	6	2	7	6	5	9	5	9	9	7	415	64	96	77	6	45
1	B9140- 32	4	5	8	7	2	8	8	9	9	9	9	9	9	330	84	91	30	8	141
2	B9140- 32	7	6	7	6	2	6	7	6	9	9	9	9	9	502	74	95	77	8	21
1	B9142- 4	4	7	9	9	5	8	8	7	9	9	7	7		401	68	94	45	8	33
1	B9144- 5	3	7	7	5	2	5	7	8	9	9	9	4		411	72	91	37	4	633
1	B9147- 3	3	0	5	4	7	8	5	7	9	7	8	7		227		78	25	5	
2	B9147- 3	4	4	5	4	7	6	6	6	9	9	9	9	7	498	59	92	64	8	
1	B9148- 5	5	0	9	9	4	6	8	7	9	9	7	9		317	71	96	64	8	43
1	B9152- 44	4	7	8	8	2	8	6	8	9	9	9	9		480	79	97	78	8	34
1	B9192- 1	3	6	8	8	2	8	7	8	9	9	9	9		510	67	97	78	8	312
1	B9208- 4	2	0	5	1	8	8	7	7	7	7	9	9		326		85	17	7	
1	B9208- 44	2	0	5	3	8	7	5	8	9	9	9	9		300		78	5	5	
1	B9212- 4	3	0	6	4	8	8	6	8	9	9	9	9		363	68	91	41	6	54
1	B9217- 7	4	5	5	5	4	7	6	7	9	9	9	9		352	71	96	41	7	43
1	B9219- 2	3	1	5	4	7	5	6	8	9	9	8	9		361	64	94	32	7	55
1	B9221- 14	3	1	4	3	9	5	6	8	9	9	9	9		272	81	77	10	6	43
1	B9224- 6	5	0	9	8	1	9	8	6	9	9	9	9		344	66	93	43	7	54
1	B9279- 9	3	0	9	7	3	8	8	7	9	9	9	9	9	379	67	89	27	7	32
1	B9282- 7	3	7	8	9	2	6	6	8	9	8	9	7		402	68	94	43	7	33
1	B9282- 12	2	4	8	8	2	6	6	8	9	7	9	9		467	68	96	80	7	626
1	B9286- 4	2	3	8	7	1	8	7	8	9	9	9	9		384	61	88	29	7	55
1	B9294- 7	2	4	8	7	2	7	6	8	9	9	9	9		447	62	90	50	7	32
1	B9311- 7	4	5	8	9	2	8	8	7	9	5	9	9		287		94	51	6	
1	B9332- 2	4	8	7	5	2	7	7	8	9	9	9	7	9	291	66	91	56	7	66
1	B9335- 3	4	5	7	6	3	6	7	8	6	9	7	9		383	68	91	48	7	33
1	B9335- 7	5	3	7	6	2	6	6	8	9	6	9	9	9	171		90	21	6	
1	B9335- 13	3	0	7	6	3	7	7	9	9	9	9	9		243	72	77	6	6	44
1	B9335- 15	5	0	7	8	1	7	8	8	9	9	9	9		211		69	4	5	
1	B9335- 17	5	2	8	7	2	8	7	8	9	9	9	5		335		82	19	6	
1	B9335- 18	5	0	8	6	2	8	8	8	9	9	9	2		324	72	89	15	7	33
1	B9335- 19	5	0	8	6	7	5	6	9	9	9	9	9		296	72	91	41	7	22
1	B9335- 20	3	0	7	5	2	9	8	8	9	9	8	4		337	76	88	38	7	32
1	B9335- 35	3	5	7	6	2	7	6	8	9	9	9	9		354	77	87	18	6	423
1	B9335- 60	5	6	8	6	2	7	7	8	9	8	9	9		297	50	82	22	7	67
1	B9336- 24	2	1	8	8	4	7	7	8	9	7	9	9		315	77	90	45	8	13
1	B9336- 27	4	3	8	8	5	6	7	8	9	9	9	9		272	79	91	6	7	22
1	B9337- 12	3	2	6	5	5	7	7		9	5	9	9		296	68	92	13	7	32
1	B9340- 3	2	2	9	9	2	5	7	8	9	9	9	8		430	71	94	51	7	623
1	B9340- 4	1	1	7	7	2	6	7	8	9	7	9	9		373	64	96	52	7	262

New Jersey Table. Continued...

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	%↑1-7/8"	%↑2-1/2"	Field Rating	Chip Color
1	B9340- 7	4	7	8	8	2	9	9	8	9	9	9	9		310	78	97	59	8	34
1	B9340- 13	4	6	8	7	2	8	8	8	9	9	9	9		338	70	93	31	8	25
1	B9344- 5	3	3	8	7	4	6	7	5	8	9	9	8		271	70	87	10	7	22
1	B9344- 15	2	5	8	7	3	7	7	8	9	5	9	8		448	68	96	52	7	21
1	B9361- 1	3	1	8	6	2	6	6	6	9	9	9	9		349	75	88	20	7	45
1	B9383- 6	2	0	4	3	4	6	7	8	9	6	9	9		262	65	90	37	8	32
1	B9383- 7	3	1	6	3	6	6	8	8	9	8	9	9		405	73	97	66	9	33
1	B9384- 4	2	0	7	7	2	6	7	8	9	9	9	9		373	69	88	23	7	21
1	B9384- 6	1	1	7	6	2	9	8	8	9	4	9	9		407	65	96	65	8	425
1	B9386- 9	2	5	8	8	2				9	7	9	7		405	74	91	45	7	32
1	B9391- 2	2	2	4	3	6	5	7	8	9	9	9	9		355	70	84	17	7	56
1	B9395- 7	2	6	6	4	4	4	6	7	9	8	9	9		256		90	18	3	
1	B9399- 1	1	1	4	4	7	6	7	8	9	9	9	9		320	68	81	6	7	44
1	B9399- 19	2	5	5	4	9	7	7	8	8	9	9	9		261	67	77	0	7	56
1	B9399- 23	1	4	8	6	4	6	6	8	9	9	9	9		344	67	91	36	6	44
1	B9416- 3	3	3	7	6	2	7	8	7	9	9	9	9		371	76	94	60	8	31
1	B9418- 7	1	0	4	2	8	7	8	7	9	9	9	9		198	75	75	0	8	12
1	B9419- 4	1	5	4	3	8	8	5	6	9	7	9	9		400	77	92	47	7	32
1	B9419- 6	4	0	7	5	5	5	8	8	9	9	9	9		373	66	83	13	7	23
1	B9423- 2	1	6	8	6	4	8	8	8	9	8	5	9		550	67	94	54	8	45
1	B9423- 4	4	7	7	6	2	6	8	9	9	9	9	9		463	64	88	33	9	13
1	B9434- 17	4	0	5	3	8	7	6	7	9	9	9	9		304	74	83	21	7	35
1	B9434- 19	3	0	5	3	7	7	6	8	9	6	9	9		279	73	94	22	6	87
1	B9436- 2	2	3	6	4	5	3	7	7	9	9	6	9		277	74	95	41	7	56
1	B9439- 1	3	7	7	8	6	8	6	8	9	9	9	9		349	84	93	64	7	533
1	B9439- 4	3	0	8	7	2	8	7	7	9	9	9	9		248	73	93	31	7	34
1	B9445- 2	3	4	9	8	3	7	6	6	9	9	9	9		291		96	51	6	
1	B9455- 3	3	5	7	7	2	8	8	8	9	9	9	9		347	71	85	19	8	34
1	B9468- 1	3	5	8	8	3	7	8	7	9	7	9	7		453	69	94	46	7	53
1	B9473- 2	2	4	7	7	1	8	8	8	9	9	9	4		410		84	26	21	
1	B9481- 2	2	4	8	8	2	7	4	6	5	9	9	9		389		91	57	5	
1	B9486- 1	2	7	8	8	2	9	9	7	9	9	9	9	9	572	70	94	61	9	24
1	B9486- 2	2	4	8	8	3	3	6	8	9	5	9	9		444		97	79	5	
1	B9489- 2	2	0	8	8	2	7	7	8	9	6	9	9		251	82	93	29	7	22
1	B9489- 4	2	0	9	9	3	7	7	8	9	9	8	9		243	88	81	23	6	11
1	B9497- 2	3	0	8	8	2	7	6	5	9	1	9	9		248	73	97	74	5	68
1	AF092- 3	3	3	8	8	2	5	5	5	9	9	9	9		267		96	59	5	
2	AF092- 3	6	5	8	7	4	7	6	5	9	9	9	9	9	452	60	91	42	7	
1	AF186- 5	5	8	7	6	3	7	6	8	9	9	9	9		376	76	91	41	7	34
1	AF201-25	8	7	8	7	3	8	6	8	7	9	9	9		525	66	95	73	7	67
2	AF201-25	8	7	8	8	4	7	6	8	7	9	9	9	9	435	77	90	40	6	
1	AF205- 9	5	8	8	7	4	7	7	9	9	7	9	8		422	76	90	40	7	43
1	AF221- 1	6	9	8	7	6	5	5	8	7	7	7	9	9	453		93	49	5	
2	AF221- 1	5	5	8	8	7	6	5	7	9	9	7	9	9	517	75	91	57	5	
1	AF222- 1	1	1	8	7	2	8	8	9	9	9	8	9		302	72	98	41	8	35
2	AF222- 1	2	1	8	8	2	8	6	6	9	9	9	9	9	319	75	94	52	6	
1	AF236-66	6	8	8	8	4	7	5	8	6	5	9	9		514	62	94	55	5	98
2	AF236-66	8	5	8	8	5	7	7	7	8	9	9	9	9	487	69	91	48	7	
1	AF238-21	4	7	8	8	2	7	5	7	9	9	9	9		470	63	94	51	5	54
1	AF299-12	1	5	7	7	2	8	7	8	9	9	9	9		256		93	63	6	

New Jersey Table. Continued...

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	%↑1-7/8"	%↑2-1/2"	Field Rating	Chip Color
2	AF299-12	4	3	8	8	3	7	7	7	9	9	9	9	9	423	59	94	62	7	
1	AF303- 5	3	4	8	7	3	8	8	9	9	9	8	9	9	422		95	45	5	
2	AF303- 5	8	8	8	7	2	6	7	7	9	9	9	4	9	433	81	91	50	4	
1	AF307- 5	3	6	8	9	2	7	7	8	9	9	9	7		493	62	98	69	8	66
2	AF307- 5	5	5	8	8	3	6	6	7	9	9	9	9	9	605	67	94	56	6	
1	AF324- 1	2	4	8	8	2	8	8	8	9	9	9	9		304	72	97	55	8	36
2	AF324- 1	6	6	8	7	2	7	6	8	9	9	9	9	9	371	67	98	90	7	32
1	AF330- 1	6	8	8	7	2	6	6	9	9	6	9	9		429	62	93	74	6	56
2	AF330- 1	8	7	7	7	4	5	5	4	9	9	9	9	9	473	69	92	62	6	
1	AK24- 3	6	9	8	8	3	7	6	7	9	9	9	9		235		92	42	5	
2	AK24- 3	8	9	9	9	2	8	5	5	7	9	9	9	6	191	55	87	30	4	
1	AS201- 4	6	9	8	7	3	9	7	9	9	9	9	9		372	72	96	78	8	55
1	AS201-10	2	7	8	8	1	9	7	7	9	9	9	9		333	65	88	32	7	64
1	A68678-1	6	9	5	4	8	8	6	7	7	9	9	8		454	78	84	31	6	77
1	A68678-1	6	8	5	4	8	8	7	7	9	9	9	6		376		82	16	7	
2	A68678-1	9	9	5	3	9	8	7	4	8	9	9	9	9	514	74	85	15	8	
1	BR5991WV16	6	9	8	8	2	7	7	7	5	7	9	9		438	70	93	64	6	33
2	BR5991WV16	8	8	9	9	2	7	7	6	2	9	9	9	1	369	65	91	45	5	
1	BR7088-18	3	5	7	8	2	6	6	8	9	7	9	9		350	76	95	63	7	43
1	BR7093-23	6	8	8	8	2	6	7	8	9	9	9	9		381	62	95	65	7	66
2	CA002- 7	8	8	7	7	2	7	5	2	8	9	9	9	7	304	68	89	31	5	
1	CC026- 1A	6	9	7	6	4	5	6	7	9	9	9	8		586	70	96	76	7	44
1	CF73058-14	4	4	8	8	2	6	7	8	9	9	9	9		445	66	97	76	8	34
1	CF73058-14	4	5	8	7	3	7	7	5	9	9	9	9		298	72	94	55	6	55
2	CF73058-14	6	6	8	7	2	6	6	8	7	9	9	9	9	556	63	88	63	7	
1	CF73058-26	5	6	7	7	3	7	7	8	9	9	9	9		381	61	96	65	7	43
2	CF73058-26	3	2	6	4	3	5	7	9	8	9	9	9	9	431	64	97	76	7	
1	CF74135- 3	1	2	8	7	2	7	8	9	9	9	9	9		427	54	95	49	8	23
2	CF74135- 3	4	2	9	9	3	7	8	6	9	9	9	4	9	592	62	97	73	4	24
1	CF75005- 5	2	5	8	7	5	6	6	8	9	8	9	9		388	70	94	59	7	535
2	CF75005- 5	5	6	8	8	7	7	6	6	9	9	9	9	9	502	58	92	60	6	
1	CF75023- 1	3	7	8	8	2	8	7	5	6	8	9	9		609	72	92	67	7	77
2	CF75023- 1	7	5	7	9	2	8	6	6	7	9	9	9	9	603	68	89	57	8	67
1	CS72018-11	3	6	8	7	2	6	7	8	9	9	9	9		314	80	90	63	7	623
1	CS72032- 4	4	6	8	8	3	6	5	7	9	9	9	9		308	65	96	66	7	33
1	CS72032- 4	5	5	8	8	2	6	7	7	9	9	9	9		385		95	61	7	
2	CS72032- 4	4	4	7	7	3	6	6	7	9	9	9	9	9	347	68	97	81	6	
1	CS73107- 8	4	5	8	7	1	9	7	8	9	9	9	9		245		88	31	6	
1	CS73132- 2	5	6	8	7	2	9	8	8	9	7	9	9		429	67	96	68	8	34
1	CS74089- 9	2	5	7	6	2	6	7	9	9	9	9	9	9	319	76	96	59	7	54
1	CS74090- 2	3	0	8	8	4	8	7	9	9	6	9	9	9	319	66	98	45	7	53
1	CS74109- 8	3	6	8	7	3	7	7	8	9	9	9	7		493	69	98	78	8	57
1	CS75003- 2	4	5	8	7	2	8	7	8	9	9	9	9	9	360	75	95	57	7	22
2	CS75003- 2	6	7	8	8	2	5	6	7	6	9	9	9	8	598	51	95	82	7	43
1	CS75003-13	2	2	8	9	2	5	7	9	9	9	9	7	9	256		91	43	6	
2	CS75003-13	6	3	8	8	2	5	6	6	6	9	9	9	9	513	64	97	78	6	
1	CS75004- 7	4	4	8	8	2	5	8	9	9	9	9	9	9	315	72	94	43	7	45
2	CS75004- 7	6	6	9	9	2	7	8	8	9	9	9	9	9	500	66	96	75	8	3
1	CS75033-13	4	6	8	8	2	9	7	8	6	9	9	9	9	317		74	11	5	
2	CS75033-13	4	4	8	8	4	5	6	8	9	7	9	9	9	371	50	85	32	6	

New Jersey Table. Continued...

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	% ↑1-7/8"	% ↑2-1/2"	Field Rating	Chip Color
1	CS75033-21	5	7	8	8	2	7	7	8	4	9	9	9	9	294		79	13	4	
2	CS75033-21	5	4	7	8	1	8	8	9	8	9	9	9	8	487		88	43	8	
1	CS75033-25	5	8	8	7	2	8	7	8	9	9	9	9	9	469		97	70	8	
2	CS75033-25	6	6	8	8	2	8	7	7	9	9	9	9	9	536		98	80	8	
1	CS75033-37	5	7	8	7	2	8	7	7	5	9	9	9		381	64	89	45	7	54
2	CS75033-37	5	5	7	8	1	8	8	9	9	9	9	9	6	531	67	90	55	7	
1	CS75034- 2	5	7	8	7	2	7	6	8	6	9	9	9	5	439		95	69	6	
2	CS75034- 2	6	6	8	8	2	6	7	5	9	9	9	9	9	536		90	63	8	
1	CS75047- 4	5	7	6	6	2	8	5	7	9	9	9	9		264		87	29	5	
2	CS75047- 4	5	6	6	4	3	8	7	6	9	9	9	9	9	422	65	89	42	7	
1	CS75049-11	5	7	8	7	3	7	5	8	9	9	9	9		208		95	47	5	
2	CS75049-11	3	5	8	8	5	8	7	8	7	9	9	9	9	433		97	74	8	
1	CS75058- 4	4	8	8	9	2	8	7	8	6	9	9	9		438	58	90	56	7	54
2	CS75058- 4	5	5	8	8	1	9	9	8	9	9	9	9	9	450	61	93	48	9	33
1	CS75067- 5	3	5	9	9	5	5	7	7	9	8	9	9		280	75	96	79	8	21
2	CS75067- 5	2	2	9	9	7	9	7	8	9	9	9	9	9	399	59	92	40	7	33
1	CS75067-13	4	7	8	7	4	5	6		9	9	9	9		246		90	35	6	
2	CS75067-13	4	4	9	9	4	7	8	9	9	9	9	9	9	506		97	80	8	
1	CS75067-26	4	7	8	8	8	7	5	7	3	6	9	9		271		82	35	5	
2	CS75067-26	3	4	9	9	8	8	6	7	8	6	9	9	9	353	62	77	13	5	
1	CS75089- 8	4	7	8	9	1	9	8	9	8	9	9	9		381	60	98	66	8	64
2	CS75089- 8	3	5	7	8	2	8	7	8	8	9	9	9	9	635	50	95	81	9	56
1	CS75091- 6	4	7	6	8	4	7	7	9	9	9	6	9		354		93	37	7	
2	CS75091- 6	5	5	7	7	3	7	6	8	9	9	9	9	9	473	74	89	45	5	
1	CS75091- 7	4	8	8	8	1	9	8	6	9	9	9	9		220		85	22	6	
2	CS75091- 7	4	7	7	7	4	6	6	7	9	9	2	9	9	377	76	93	66	2	
1	CS75093-11	2	3	8	8	3	8	7	9	8	9	8	9		278		89	54	6	
2	CS75093-11	3	2	9	9	1	9	9	7	9	9	9	9	9	498		95	72	9	
1	CS75098- 1	2	2	6	5	4	7	7	8	9	9	9	9		262		90	29	6	
2	CS75098- 1	3	3	6	4	4	6	6	8	9	7	9	9	9	399	60	93	78	6	
1	CS75111- 5	2	6	8	9	4	6	8	8	9	9	9	9	7	262	81	83	11	6	65
2	CS75111- 5	4	5	8	8	6	8	6	7	7	9	9	9	9	359	69	92	54	6	
2	CS76019- 9	8	9	9	9	3	5	6	7	6	9	9	9	2	536	66	93	63	7	
2	CS76084- 9	4	2	8	8	2	7	7	3	9	9	9	9	9	124	61	92	77	5	
1	F67036	5	7	7	6	4	5	6	9	9	9	9	9	9	496		95	50	6	
2	F67036	7	8	8	8	7	7	5	7	6	9	9	9	5	471	63	94	61	4	
1	F69016	3	5	7	8	4	7	6	7	6	9	9	9		306		91	55	5	
2	F69016	7	7	9	8	8	6	4	7	5	9	9	9	5	422	71	95	62	4	
1	F69026	3	5	2	8	4	8	7	6	9	9	9	9		312	68	94	32	7	65
2	F69026	5	4	1	8	5	6	6	5	9	9	9	9	9	453	61	94	64	6	
1	NY-59	6	9	8	9	2	7	7	7	9	9	9	6		277		91	51	3	
2	NY-59	7	4	9	9	1	9	8	7	9	9	9	6	9	440	69	90	59	6	
1	NY-61	2	4	8	9	2	7	8	5	9	9	9	9		294	66	90	37	7	45
1	NY-62	4	6	9	9	2	8	8	8	9	9	9	7		287		97	57	5	
1	NY-63	3	5	8	9	2	8	9	8	9	9	9	6		453	62	95	63	8	65
1	NY-66	6	8	8	7	2	6	8	9	9	9	9	9		281	74	97	66	8	65
1	NY-66	5	5	8	7	2	9	7	8	9	9	8	9		473	70	95	67	8	54
1	Q 54- 6	6	8	8	9	2	9	8	6	9	9	9	9		367	66	94	75	7	67
1	Q 54-11	6	0	8	8	4	5	7	8	9	9	9	9		338	71	94	38	7	55
1	Q155- 3	1	1	9	9	2	5	7	9	9	9	9	9		320	64	93	57	7	22

New Jersey Table. Continued...

Exp No.	Seedling	Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Gr.	Hollow Heart	Int. Necrosis	Heat Sprout	Total Yield cwt	Sp Gr	% ↑ 1-7/8"	% ↑ 2-1/2"	Field Rating	Chip Color
1	R471-62	4	5	8	8	3	8	6	8	9	9	9	4		319		94	54	6	
1	R471-62	4	5	8	7	3	7	6	8	9	6	9	4		191		77	0	3	
2	R471-62	7	5	7	6	2	7	6	5	9	6	9	7	9	552	60	91	56	6	
1	S303- 8	4	7	8	7	3	5	5	7	6	9	9	9		389		92	55	5	
2	S303- 8	8	7	8	7	2	8	6	8	9	9	9	6	9	659	72	91	66	6	
1	S374- 4	4	5	8	7	2	7	7	9	9	8	7	9		260		84	20	6	
2	S374- 4	8	7	7	7	3	6	7	8	9	9	9	9	9	447	61	89	33	7	
1	S376- 1	3	5	8	8	2	8	7	8	9	7	9	9		355	69	97	51	7	22
2	S376- 1	5	2	7	7	2	6	6	7	9	9	9	9	9	487		95	72	7	
1	S376- 2	2	4	8	8	3	7	7	7	9	9	9	9		306	59	94	57	7	66
2	S376- 2	3	2	7	7	2	7	6	6	9	9	9	9	9	401	61	92	62	6	
1	S377- 8	3	4	8	7	1	9	8	9	9	9	9	9		290	61	91	54	7	67
2	S377- 8	4	2	7	6	2	8	7	7	9	9	9	9	9	588	60	91	35	8	56
1	S377-41	3	8	8	7	2	8	8	8	9	9	9	6		389		93	39	5	
2	S377-41	8	7	9	9	2	6	7	7	9	9	9	9	9	486	73	92	60	7	
1	S377-59	2	4	7	7	2	8	7	9	9	7	9	9		242		88	38	7	
2	S377-59	5	2	7	7	3	7	8	8	9	9	9	9	9	419		87	50	8	
1	W564-3A	5	6	7	6	8	9	5	6	7	9	9	9		378		95	44	6	
2	W564-3A	4	3	4	3	8	7	5	4	6	6	9	9	9	487	58	94	55	6	
1	W718	4	6	8	8	2	6	7	8	9	9	9	8		419	65	96	63	7	45
2	W718	6	3	9	9	2	8	7	8	9	9	9	9	9	438	61	95	69	8	22
1	ALLAGASH R	4	0	4	4	7	5	6	8	9	9	9	9		206	66	94	41	7	13
2	ALLAGASH R	2	1	6	4	4	6	6	7	8	9	9	9	9	342		93	48	6	
1	BELCHIP	4	8	8	8	2	2	5	7	9	9	6	9		479	75	97	76	7	635
1	BELRUS	2	4	4	2	8	5	8	9	8	9	9	9		264	76	92	36	8	42
2	BELRUS	4	3	4	2	8	7	8	9	7	9	9	9	9	359		89	30	8	
1	BUTTE	4	4	6	7	4	6	6	6	9	9	9	9		174		57	0	5	
2	BUTTE	8	9	7	5	8	7	3	4	5	9	9	9	5	423	74	67	4	5	
1	CAMPBEL-11	2	3	7	9	3	6	8	8	9	9	9	9		318	69	94	63	7	33
1	CROATAN	3	2	8	8	2	7	6	6	9	7	9	9		347	58	94	48	7	43
2	CROATAN	3	3	7	9	2	7	7	5	9	9	9	9	9	419	56	92	55	7	33
1	DENALI	3	7	8	8	3	8	7	8	9	9	9	9		394	81	96	52	8	46
2	GREEN MTN	8	9	8	8	6	6	3	3	3	9	9	9	6	415	66	86	25	2	
1	HUDSON	6	9	8	8	2	7	5	6	7	9	9	7		431		97	63	7	
1	JEMSEQ	2	4	7	7	2	8	7	8	9	6	9	9		290	62	95	72	7	66
2	JEMSEQ	3	4	7	5	6	7	6	7	9	9	9	9	9	395	66	97	73	6	
1	KATAHDIN	2	8	8	8	2	6	7	8	9	9	9	9		417		95	72	7	
2	KATAHDIN	4	6	9	9	2	5	7	7	9	9	9	9	9	517	66	93	73	8	
1	NOR RUSSET	4	7	5	5	7	7	6	8	6	6	9	9		331		86	43	5	
1	NORCHIP	2	5	8	8	2	5	5	6	9	6	9	9		352		95	33	5	
2	NORCHIP	3	4	8	8	2	7	6	5	9	6	9	9	9	487	71	95	67	6	
1	ONTARIO	6	9	8	7	2	6	7	8	9	9	9	9		330	65	94	63	6	232
1	PENN 71	3	8	8	9	2	1	4	5	9	9	6	5		446		97	72	5	
2	PENN 71	4	3	9	9	3	3	6	5	9	9	9	9	9	467	70	94	62	5	22
1	R BURBANK	5	9	6	4	9	8	2	7	1	9	9	9		481		92	44	4	
1	SUPERIOR	3	5	8	6	3	6	6	5	9	9	9	9		474		96	73	7	
2	SUPERIOR	3	3	7	7	3	5	7	5	8	9	9	9	9	447	66	95	62	7	

NEW YORK STATE (LONG ISLAND)

R.S. Greider, J.B. Sieczka and J.F. Creighton

Long Island Potato Variety Trials, 1980

Background. Four potato variety trials, a spacing experiment involving four clones and a fertility trial involving five lines were conducted at the Long Island Horticultural Research Laboratory at Riverhead, New York. All trials were conducted on a Haven Loam soil. Precut seed was planted on April 25 (Round White #2, Russet and NE107 trials) and May 5-7 (Round White #1, spacing and fertility). Twelve hundred pounds of 7-21-14 fertilizer was applied in a band at planting and 80 lbs. nitrogen was sidedressed. Thimet 15G at 12 lbs. was placed in the seed furrow at planting. Herbicides Lasso, Lorox and Premerge were applied at ground crack and Eptam was applied at layby.

The growing season was unusually hot and dry during July and August. Favorable conditions during May and June allowed early developing clones to generally outperform late developing lines, which were adversely affected by extreme weather conditions during August. Numbered lines also generally outperformed named standard varieties such as Katahdin in this highly unusual growing season. The three to four irrigations supplied to the plot area were generally insufficient for good crop development.

Fungicide and insecticide sprays were applied at weekly intervals during the season beginning in early June. Plots were vine killed on September 5 or September 17. Dates of harvest were September 29 through October 2.

Tubers were graded within a week after harvest. Potato chip samples were fried on October 23.

Treatments were replicated four times except in a few cases where there was only enough seed for three replications. Plots were 15 feet long by two rows wide (four rows wide for fertilizer trials). Rows were 34 inches apart and spacing within the row was nine inches except where spacing was a variable.

L.I. Round White Trial #1. (Table 1.) Thirteen lines from the U.S.D.A. breeding program and the standards Katahdin and Superior were entered in this trial. The numbered lines are all resistant to golden nematode. Very high yielding clones include B8771-6, B9016-20, B8798-20, B8914-8, B-B9019-14, B9097-5 and B8983-5. Lines B8771-6, B9097-5, B8983-5, Superior, B8751-6 all had appearance scores above 8.0. Lines B9097-5, B8983-5 and B8832-3 had exceptionally good chip color scores. Internal necrosis was a problem in several lines, including B8771-6, B8914-8, B8983-5, B8887-1 and most unusually Katahdin. Low percent marketable yield will eliminate lines B9099-5, B8887-1, B9020-18 and B7151-4.

Promising lines which will be retested include B9016-20, B8798-20, B9019-14 and B9097-5.

L.I. Round Trial #2. (Table 2.) Four named varieties and 11 breeding lines from University of Maine, U.S.D.A. and Cornell University were compared in this trial. All lines except the named varieties and B8491-24 are resistant to golden nematode. Lines yielding above 350 cwt. per acre include AF201-25, AF236-1, B8710-16, B7592-1, NY63, and B8491-1. Lines with appearance scores above 8.0 include AF236-1, B8710-16, NY63, B6987-184 and Norland. Line AF236-1 had a superior chip color score.

Internal necrosis was excessive in lines AF201-25 and Michimac and demonstrated a potential problem in B8710-16, NY63, NY61, Katahdin and B8706-7. Lines with low yield or low percent marketable yield include NY61, Katahdin, B8706-7 and Norland. Line B6987-184 had an exceptionally high specific gravity of 1.093. Lines AF236-1 and B8491-1 had greater than 10 percent of total yield over four inches in diameter (chef's). This is very unusual for 1980.

Especially promising lines from this trial include AF236-1, B8710-16, B7592-1, NY63 and B6987-184.

L.I. NE107 Trial. (Table 3.) Nine named varieties and six numbered lines supplied through the Northeast Regional Project 107 were evaluated in this experiment. Lines C7358-14a, AF186-5, AF205-9, CA02-7, Campbell 11, Campbell 13, Wauseon, Hudson and Peconic are resistant to race A golden nematode. Clones giving yields above 350 cwt. per acre were AF92-3, CF7358-14a, B7802-2 and AF186-5. Lines C7358-14a, AF205-9, Campbell 11 and CA02-7 had appearance scores above 8.0. Lines B7802-2, Wauseon and Campbell 11 had very good chip color scores. Peconic was the only variety to have excessive internal necrosis. Line AF92-3, Superior and Kennebec had poor appearance scores. Jemseg, Peconic and CA02-7 had very low marketable yields.

The medium-early maturing line C7358-14a (University of Maine) performed extremely well under our very severe conditions this past season. Other good performers include B7802-2, AF186-5, AF205-9, Hudson and Campbell 11.

L.I. Russet Trial. (Table 4.) Ten long, russet-skinned potato cultivars were tested in this trial. Line B8934-4 is resistant to race A golden nematode. Marketable yield was generally low for all varieties. Tuber size was mostly very small. Only 18 percent of Butte tubers reached the size of four ounces. Internal necrosis was a problem with lines B8934-4 and A68678-1 (Lemhi). Specific gravities were also disappointingly low for most lines. Those with gravities below 1.070 (unacceptable for baking potatoes) were W564-3A, B8934-4, B8847-8 and Allagash Russet. Russet Burbank had only 25 percent marketable yield due to a high degree of under-four-ounce-size and misshapen tubers.

Lines B8972-1, B7583-6 and BelRus show some promise from the standpoint of tuber conformation, specific gravity, and percent marketable yield. BelRus also produced an extremely good potato chip. Yields of russets in 1980 were not high enough to compete in the marketplace with standard round whites.

Long Island Variety/Spacing Trials. (See Table 5.) Five trials were conducted to determine optimum seed spacing for lines C7358-14a, AF205-9, AF186-5 and NY66. Seed tubers were hand planted at seven, nine, and 11 inches apart. Some of the seed was inadvertantly cut too small so an additional nine-inch spacing treatment with less than 1.3-ounce seedpieces was added to determine how small seed would affect tuber yields.

Line C7358-14a produced significantly higher yield with large seed size as compared to small seed. There was also a tendency for increased yield with wider spacing (not significant). This is probably related to the hot, dry growing season putting additional stress on the higher population plots. Percent marketable yield was not significantly affected by spacing although there was a trend for higher percent marketables with the wider spacing. Internal defects such as hollow heart were not a problem with this variety.

Line AF205-9 also showed a tendency for increased yield with lower plant populations and large seed. The means, however, are not significantly different. With this clone, percent marketable yield was increased significantly with the 11-inch spacing. This is due to a reduction in under 1-7/8 inch tubers. Internal necrosis tended to be a moderate problem with this line.

Seed spacing had no effect on yield of line AF186-5. There was a trend indicating lower yield with small-sized seed. Percent marketable yield did not vary among treatments and there were no internal defects recorded.

The two spacing treatments had no effect upon yield or percent marketable yield of NY66. Fourteen percent of the tubers cut had internal necrosis.

Long Island Variety/Nitrogen Rate Experiment. (Table 6.) Tuber yield, size distribution and specific gravity for varieties BelRus, Katahdin, Rosa (NY61), B6987-184 and B7583-6 were determined at two rates of nitrogen fertilization. Plots were four rows wide by 25 feet long. Data was taken from the two center rows. A complete analysis fertilizer was applied to both treatments at planting. Fifty additional pounds of nitrogen was applied to the high-nitrogen treatment as a sidedress.

Treatments had no significant effect upon yields or specific gravity. However, except for Rosa, there was a tendency for increased yield with increased nitrogen rate. Lack of rainfall and high temperatures were probably greater limiting factors than nutrient availability in 1980.

TABLE 1. LONG ISLAND ROUND WHITE TRIAL NO. 1.

LINE	CWT/A MKT. YIELD 1/	CWT/A TOTAL YIELD	% OF TOTAL YIELD MKT. OVER 1-7/8"	OVER 4"	UNDER 1-7/8"	3/ CULLS	4/ HOLLOW HEART	4/ BROWN CENTER	4/ INTERNAL NECROSIS	S.G.	5/ APPR. RATING	6/ VINE MATURITY	7/ CHIP COLOR
1. B8771-6	393a 2/	419	93	3	4	2	0/40	2/40	17/40	1.078	8.0	M	7.0
2. B9016-20	389a	415	93	7	6	0	0/40	0/40	0/40	1.063	7.5	M	7.0
3. B8798-20	386a	404	93	0	5	1	0/40	0/40	5/40	1.084	7.7	L	5.0
4. B8914-8	360ab	413	87	0	10	3	0/30	0/30	17/30	1.076	7.6	ML	6.5
5. B9019-14	357abc	384	93	0	6	1	0/40	1/40	2/40	1.066	7.0	E	7.0
6. B9097-5	353abc	380	93	2	6	0	0/40	0/40	1/40	1.074	8.2	E	5.5
7. B8983-5	348abcd	384	90	1	8	1	0/40	0/40	7/40	1.087	8.2	ML	5.5
8. B9099-5	340abcd	427	79	0	7	13	0/40	0/40	0/40	1.078	5.5	ML	6.0
9. B8887-1	324abcde	379	85	2	12	2	2/40	0/40	12/40	1.076	7.7	M	6.0
10. Superior	321abcde	362	88	0	10	2	0/40	0/40	1/40	1.070	8.0	ME	--
11. Katahdin	297bcde	333	89	0	10	1	0/40	0/40	7/40	1.069	7.7	L	--
12. B8751-6	285cde	311	91	0	7	1	0/40	0/40	0/40	1.071	8.0	ME	7.0
13. B9020-18	279de	340	82	3	9	9	0/40	1/40	6/40	1.062	7.5	M	7.5
14. B7151-4	277de	332	83	1	13	13	0/40	1/40	0/40	1.078	5.2	L	7.0
15. B8832-3	253e	289	87	3	11	1	1/40	0/40	2/40	1.075	7.5	M	5.5

1/ Marketable yield = yield of U.S. No. 1 tubers over 1-7/8" in diameter.
2/ Means followed by the same letter are not significantly different at .05 level, Duncan's New Multiple Range Test.
3/ Culls include tubers with sunburn, growth cracks, knobs, enlarged lenticels, etc.
4/ Ten tubers between 3 and 4 inches from each replication were cut and inspected for hollow heart, brown center and internal necrosis. Numerator = number of tubers with defect. Denominator = total number of tubers observed.
5/ Based on 1-10 scale, 10 being perfect conformation.
6/ VE = very early; E = early; ME = medium early; M = mid-season; ML = medium late; L = late; VL = very late.
7/ Chip colors are based upon a scale of 1 = very light; 10 = very dark. Values of 6.5 and below are considered acceptable.

TABLE 2. LONG ISLAND ROUND TRIAL NO. 2.

LINE	CWT/A MKT. YIELD[1/]	CWT/A TOTAL YIELD	% OF TOTAL YIELD MKT. OVER 1-7/8"	OVER 4"	UNDER 1-7/8"	3/ CULLS	4/ HOLLOW HEART	4/ BROWN CENTER	4/ INTERNAL NECROSIS	S.G.	5/ APPR. RATING	6/ VINE MATURITY	7/ CHIP COLOR
1. AF201-25	423a[2/]	467	90	8	6	3	0/40	0/40	8/40	1.076	7.5	L	6.5
2. AF236-1	396ab	435	91	12	7	2	0/40	0/40	1/40	1.076	8.2	L	5.5
3. B8710-16	388abc	439	88	2	7	4	0/40	0/40	5/40	1.068	8.5	E	6.5
4. B7592-1	370abcd	422	87	2	10	2	0/40	0/40	1/40	1.079	7.5	L	6.5
5. NY63	365abcd	401	91	7	6	3	0/40	0/40	6/40	1.073	8.2	L	7.5
6. B8491-1	364abcd	394	92	18	4	3	0/40	0/40	0/40	1.076	6.5	L	7.0
7. B8491-24	348bcd	377	92	7	6	1	0/40	0/40	0/40	1.075	7.0	M	7.0
8. NY66	336bcde	374	90	2	5	5	0/40	0/40	0/40	1.077	7.0	L	7.0
9. NY61	331cdef	393	84	1	14	1	0/40	0/40	4/40	1.071	7.5	L	6.0
10. B6987-184	327cdef	364	90	4	9	1	0/40	0/40	3/40	1.093	8.0	L	6.0
11. Michimac	322def	354	90	1	9	1	0/40	0/40	9/40	1.069	7.0	L	6.0
12. Superior	275efg	317	87	1	11	2	0/40	0/40	0/40	1.074	7.0	ME	6.0
13. Katahdin	272fg	319	84	1	14	1	0/30	0/30	4/30	1.069	7.7	L	7.0
14. B8706-7	256g	328	76	6	9	15	0/40	0/40	6/40	1.079	6.2	ML	7.0
15. Norland	245g	284	86	1	11	2	0/40	0/40	1/40	1.058	8.0	VE	7.0

1/ Marketable yield = yield of U.S. No. 1 tubers over 1-7/8" in diameter.
2/ Means followed by the same letter are not significantly different at .05 level, Duncan's New Multiple Range Test.
3/ Culls include tubers with sunburn, growth cracks, knobs, enlarged lenticels, etc.
4/ Ten tubers between 3 and 4 inches from each replication were cut and inspected for hollow heart, brown center and internal necrosis. Numerator = number of tubers with defect. Denominator = total number of tubers observed.
5/ Based on 1-10 scale, 10 being perfect conformation.
6/ VE = very early; E = early; ME = medium early; M = mid-season; ML = medium late; L = late; VL = very late.
7/ Chip colors are based upon a scale of 1 = very light; 10 = very dark. Values of 6.5 and below are considered acceptable.

TABLE 3. LONG ISLAND NE 107 TRIAL

LINE	CWT/A MKT. YIELD[1]	CWT/A TOTAL YIELD	% OF TOTAL YIELD MKT. OVER 1-7/8"	OVER 4"	UNDER 1-7/8"	[3] CULLS	[4] HOLLOW HEART	[4] BROWN CENTER	[4] INTERNAL NECROSIS	S.G.	[5] APPR. RATING	[6] VINE MATURITY	[7] CHIP COLOR
1. AF92-3	426a[2]	461	92	3	5	2	0/40	0/40	3/40	1.069	6.2	M	6.0
2. C7358-14a	421ab	450	93	2	6	1	0/40	0/40	0/40	1.068	9.0	ME	6.0
3. B7802-2	378abc	400	94	0	4	3	0/40	0/40	0/40	1.069	7.0	E	5.5
4. AF186-5	354abcd	393	90	0	9	1	1/40	0/40	0/40	1.076	7.5	ML	6.0
5. Campbell 13	346bcd	383	90	2	8	2	0/40	0/40	0/40	1.072	7.2	ME	6.0
6. Wauseon	338cd	378	89	0	9	2	0/40	0/40	4/40	1.075	7.2	ML	5.5
7. AF205-9	337cd	374	90	1	8	2	0/40	0/40	1/40	1.082	8.5	ML	6.5
8. Kennebec	335cd	371	90	1	9	1	0/40	0/40	0/40	1.075	6.7	VL	7.5
9. Hudson	333cd	349	95	4	4	0	0/40	0/40	0/40	1.076	7.7	L	6.5
10. Superior	332cd	364	91	1	7	2	0/40	0/40	0/40	1.073	6.5	E	6.0
11. Chippewa	321cd	343	94	5	5	1	0/40	0/40	0/40	1.069	7.5	ML	6.5
12. Campbell 11	317cd	344	92	1	5	2	1/40	0/40	1/40	1.079	8.0	M	5.5
13. Jemseg	286d	312	91	2	5	3	1/40	0/40	1/40	1.071	8.7	VE	7.0
14. Peconic	284d	319	89	1	9	1	0/40	0/40	9/40	1.084	7.5	ME	6.0
15. CA02-7	277d	315	88	0	12	1	0/40	0/40	0/40	1.069	8.0	L	6.5

1/ Marketable yield = yield of U.S. No. 1 tubers over 1-7/8" in diameter.
2/ Means followed by the same letter are not significantly different at .05 level, Duncan's New Multiple Range Test.
3/ Culls include tubers with sunburn, growth cracks, knobs, enlarged lenticels, etc.
4/ Ten tubers between 3 and 4 inches from each replication were cut and inspected for hollow heart, brown center and internal necrosis. Numerator = number of tubers with defect. Denominator = total number of tubers observed.
5/ Based on 1-10 scale, 10 being perfect conformation.
6/ VE = very early; E = early; ME = medium early; M = mid-season; ML = medium late; L = late; VL = very late.
7/ Chip colors are based upon a scale of 1 = very light; 10 = very dark. Values of 6.5 and below are considered ›table.

TABLE 4. LONG ISLAND RUSSET TRIAL

LINE	CWT/A MKT. YIELD 1/	CWT/A TOTAL YIELD	% OF TOTAL YIELD OVER 4 OZ.	OVER 10 OZ.	UNDER 4 OZ.	3/ CULLS	4/ HOLLOW HEART	4/ BROWN CENTER	4/ INTERNAL NECROSIS	S.G.	5/ APPR. RATING	6/ VINE MATURITY	7/ CHIP COLOR
1. W564-3A	265a 2/	422	62	6	35	1	0/40	0/40	5/40	1.067	8.2	M	7.0
2. B8934-4	250a	331	75	23	17	7	2/40	0/40	16/40	1.068	8.0	ML	6.0
3. B8847-8	236a	336	70	11	19	10	0/40	0/40	0/40	1.068	6.5	E	7.5
4. B8972-1	219a	278	79	21	18	3	2/40	2/40	0/40	1.070	9.0	ME	6.5
5. B7583-6	215a	314	68	9	32	0	0/40	0/40	4/40	1.075	8.0	L	8.0
6. Allagash Russet	209a	281	73	11	24	2	0/40	0/40	2/40	1.064	7.5	E	6.0
7. A68678-1	209a	320	66	6	30	4	0/40	0/40	10/40	1.079	7.0	VL	7.0
8. BelRus	126b	195	64	4	29	7	0/40	0/40	1/40	1.072	8.5	E	5.0
9. Russet Burbank	57c	225	25	0	36	38	0/40	0/40	2/40	1.075	4.5	L	7.5
10. Butte	28c	154	18	0	79	3	--	--	--	1.082	5.5	VL	7.5

1/ Marketable yield = yield of U.S. No. 1 tubers over 1-7/8" in diameter.
2/ Means followed by the same letter are not significantly different at .05 level, Duncan's New Multiple Range Test.
3/ Culls include tubers with sunburn, growth cracks, knobs, enlarged lenticels, etc.
4/ Ten tubers between 3 and 4 inches from each replication were cut and inspected for hollow heart, brown center and internal necrosis. Numerator = number of tubers with defect. Denominator = total number of tubers observed.
5/ Based on 1-10 scale, 10 being perfect conformation.
6/ VE = very early; E = early; ME = medium early; M = mid-season; ML = medium late; L = late; VL = very late.
7/ Chip colors are based upon a scale of 1 = very light; 10 = very dark. Values of 6.5 and below are considered acceptable.

TABLE 5. SPACING TRIALS, LONG ISLAND - 1980

LINE	SPACING INCHES	SEED SIZE	MKT. YIELD 1/	TOTAL YIELD	% MKT. YIELD	% OVER 4"	% UNDER 4"	4/ HOLLOW HEART	4/ BROWN CENTER	4/ INTERNAL NECROSIS
C7358-14a	11	large	287a 2/	307	93a 2/	1	7	0/40	0/40	0/40
C7358-14a	9	large	284a	307	92a	0	8	0/40	0/40	0/40
C7358-14a	7	large	270ab	297	91a	0	9	0/40	0/40	0/40
C7358-14a	9	small	237b	256	92a	2	8	0/40	0/40	1/40
AF205-9	11	large	264a	298	88a	0	12	0/40	0/40	5/40
AF205-9	9	large	233a	275	84ab	0	15	0/40	0/40	2/40
AF205-9	9	small	219a	254	85ab	0	14	0/40	0/40	3/40
AF205-9	7	large	209a	253	82b	0	18	0/40	0/40	3/40
AF186-5	11	large	277a	300	92a	0	8	0/40	0/40	0/40
AF186-5	9	large	275a	299	91a	1	8	0/40	0/40	0/40
AF186-5	7	large	273a	300	91a	0	9	0/40	0/40	0/40
AF186-5	9	small	257a	282	91a	1	9	0/40	0/40	0/40
NY66	9	large	356a	370	96a	1	3	0/50	0/50	8/50
NY66	7	large	352a	365	96a	0	4	0/50	0/50	6/50

1/ Marketable yield = yield of U.S. No. 1 tubers over 1-7/8" in diameter.
2/ Means followed by the same letter are not significantly different at .05 level, Duncan's New Multiple Range Test.
4/ Ten tubers between 3 and 4 inches from each replication were cut and inspected for hollow heart, brown center and internal necrosis. Numerator = number of tubers with defect. Denominator = total number of tubers observed.

TABLE 6. LONG ISLAND. The effect of nitrogen rate on tuber yield, size distribution and specific gravity BelRus, Katahdin, Rosa, B6987-184, and B7583-6.

Treatment		Yield (cwt/A)		% of Total Yield				
Clone	lbs N/A	Total	US No. 1 1-7/8-4" (4-16 oz)	<1-7/8" (<4 oz)	1-7/8-4" 4-10 oz)	(10-16 oz)	>4" (>16 oz)	Specific Gravity
BelRus								
	150	190	100	47	38	15	-	1.082
	200	193	124	38	48	15	-	1.082
		(ns)	(ns)					(ns)
Katahdin	100	239	216	7	88		3	1.065
	150	254	228	7	90		1	1.064
		(ns)	(ns)					(ns)
Rosa	100	220	183	17	83		0	1.068
	150	214	174	19	81		0	1.069
		(ns)	(ns)					(ns)
B6987-184	100	274	242	11	88		0	1.088
	150	289	253	12	88		0	1.091
		(ns)	(ns)					(ns)
B7583-6	100	264	252	8	92		0	1.076
	150	286	261	6	91		1	1.079
		(ns)	(ns)					(ns)

NEW YORK STATE (LONG ISLAND)

R.S. Greider

Post Harvest Evaluations of 1979 Potato Variety Material, Long Island

Potato varieties and breeding lines from the 1979 Long Island variety trials were evaluated for the following quality attributes: percent shrink during six-month storage period, general appearance after storage, and susceptibility to internal blackspot disorder. Results of these tests are given in the following report.

Internal Blackspot. Blackspot was inflicted by dropping a metal pin of 175 grams onto the stem end and the side of 24 tubers from a height of 30 cm. Tubers had a temperature of 5° C (40° F) at moment of treatment. Blackspot was assessed 24 hours later after slicing potatoes until highest color intensity was reached. The following scale was used: 0 = no blackspot, 1 = very weak, 2 = weak, 3 = moderate, 4 = severe, 5 = very severe discoloration. Individual scores were added up and divided by number of tubers (24), This test was conducted on April 28, 1980.

Blackspot ratings were not particularly severe. Varieties with moderate blackspot ratings include Superior, Batoche, Bison, Alaska Red and B8932-2. Lines which exhibited a high degree of freedom from blackspot are Hudson, CA02-7, B7744-5, 4Q61-12, Onaway, Campbell 11, 8YW-1, B8779-1, NY63, B6986-2, R471-62, CD138-4R, MaineRus and Centennial Russet. Line NY63 showed almost a complete tolerance to blackspot.

Weight loss and appearance after storage data was lost for the NE107 early, red, mid-season, and late round white trials. Weight loss was not particularly high except for two early russeted varieties -- BelRus and Centennial Russet. These varieties were badly shriveled when removed from storage.

TABLE 1. Test results (arranged by order of decreasing marketable yield within each experimental group).

VARIETY	BLACKSPOT END	BLACKSPOT SIDE	TUBER CONFORMATION 11/9	TUBER CONFORMATION 4/30	% WEIGHT LOSS 189 DAYS 40° F
NE107 Early Trial					
Denali	2.21	1.26	6.0	--	--
B7802-2	2.00	1.68	9.0	--	--
AF186-5	1.21	1.83	8.0	--	--
CROATAN	2.31	1.45	6.0	--	--
AF238-21	1.63	1.68	4.0	--	--
CF26-1	2.36	1.63	7.0	--	--
CF7358-14	1.92	1.04	7.0	--	--
B6969-2	2.17	0.88	7.0	--	--
Superior	3.08	1.79	7.0	--	--
Campbell 11	1.92	1.36	7.0	--	--
Jemseg	2.38	1.75	9.0	--	--
NE107 Late Trial					
Hudson	1.44	0.48	7.0	7.0	6.0
AF92-3	1.83	0.63	7.0	7.0	5.5
Kennebec	1.39	1.88	5.0	4.0	5.7
AF205-9	1.83	0.71	7.0	7.0	4.4
CF7356-13	1.79	0.63	7.0	8.0	4.7
CA02-7	1.42	0.79	8.0	8.0	4.6
CF72107-3	2.29	0.48	8.0	7.0	4.2
BR7088-18	1.63	0.46	7.0	8.0	4.7
F69016	2.13	0.96	6.0	6.0	3.2
CD106-16	1.71	1.08	6.0	6.0	4.6
AF186-2	1.67	2.04	7.0	7.0	4.1
B6987-184	2.04	1.38	7.0	6.0	3.7
Red Trial					
B7744-5	1.17	0.48	5.0	--	--
Batoche	3.21	3.63	6.0	--	--
Chieftain	2.83	2.58	9.0	--	--
Bison	3.50	2.29	9.0	--	--
Alaska Red	3.46	1.56	7.0	--	--
Norland	2.17	0.46	8.0	--	--
Early Round Whites					
4Q61-12	0.96	0.30	7.0	3.0	3.3
CS73132-2	2.88	1.79	8.0	7.0	1.7
4Q74-12	2.25	1.96	8.0	7.0	2.1
Onaway	0.79	0.48	6.0	3.0	2.1
B8884-7	2.42	0.37	7.0	7.0	3.9
B8907-3	2.46	1.79	8.0	8.0	2.6
B8711-2	2.92	0.60	9.0	7.0	2.9
B8710-16	2.33	1.25	9.0	9.0	1.9
Chippewa	2.04	0.42	6.0	4.0	2.5

VARIETY	BLACKSPOT END	BLACKSPOT SIDE	TUBER CONFORMATION 11/9	TUBER CONFORMATION 4/30	% WEIGHT LOSS 189 DAYS 40° F
Early Round Whites continued					
B8710-11	2.65	1.63	9.0	8.0	1.5
Campbell 11	1.35	0.33	9.0	9.0	3.4
B7200-33	1.63	0.83	9.0	8.0	2.3
B8932-2	3.04	1.75	8.0	9.0	0.5
AS201-10	2.58	0.62	9.0	9.0	0.8
Q94-25	2.18	0.73	7.0	6.0	2.2
Mid-Season Round Whites					
4Q61-8	2.21	1.42	5.0	--	--
Q53-5	2.81	1.58	5.0	--	--
Q54-11	2.52	1.36	5.0	--	--
B7592-1	2.32	1.32	6.0	--	--
8YW-1	1.23	1.24	7.0	--	--
B8491-24	1.79	1.04	6.0	--	--
NY61	1.68	0.83	7.0	--	--
Katahdin	1.63	0.92	7.0	--	--
NY65	2.50	2.46	6.0	--	--
CS7212-4	1.71	0.21	8.0	--	--
B7805-1	2.29	1.65	8.0	--	--
B8689-6	2.54	1.17	7.0	--	--
R471-89	1.76	0.96	8.0	--	--
B8779-1	1.21	0.58	6.0	--	--
Late Round Whites					
NY63	0.29	0.13	6.0	--	--
8YY-1	1.96	0.41	6.0	--	--
8YY-3	1.92	0.88	4.0	--	--
AS201-4	1.88	0.71	7.0	--	--
B6986-2	1.38	0.25	7.0	--	--
NY66	1.52	0.79	8.0	--	--
NY64	2.71	1.29	7.0	--	--
R471-62	1.50	0.40	8.0	--	--
CS73107-8	1.83	0.38	7.0	--	--
B8877-1	2.21	1.42	7.0	--	--
8NW-8	2.04	1.00	7.0	--	--
Katahdin	1.63	0.74	7.0	--	--
R471-8	1.96	0.54	7.0	--	--
B8690-12	1.75	0.38	8.0	--	--
B8491-1	1.79	0.38	6.0	--	--
Russets					
CD138-4R	1.25	1.20	7.0	7.0	5.0
R. Burbank	1.96	0.63	6.0	5.0	3.6
MaineRus	1.46	0.46	6.0	7.0	2.7
Norgold L	1.57	0.63	6.0	7.0	3.8
B7583-6	1.54	0.75	6.0	7.0	2.8
Centennial	1.17	0.54	8.0	7.0	7.1
BelRus	2.42	0.75	8.0	7.0	8.9

NEW YORK (Long Island)
B.A. Taborsky

Evaluation of Potato Cultivars and Breeding Lines for Scab Resistance at Riverhead, New York in 1980.

One hundred seventy seven cultivars and breeding lines were evaluated for scab resistance at Cornell University's L.I. Horticultural Research Laboratory in Riverhead, New York. Seed sources included the NE 107 Regional Potato Improvement Project, the University of Maine, Canada Dept. of Agriculture at Fredericton, N.B., USDA Potato Breeding Project, Pennsylvania State University and Cornell University.

The Haven loam soil was naturally infested with Streptomyces scabies and has been maintained at a pH of about 5.6 to 6.8 with applications of lime each spring. The 10-hill single-row plots were hand-planted on May 9. Seedpieces were spaced 12 inches apart. Each test plot was paired with one of the Chippewa cultivar, which was machine-planted with seedpieces spaced about 9 inches apart. All rows were 34 inches apart. 7-14-21 fertilizer was applied at 1200 lb/A as the furrows were opened and Thimet 15G at 13.3 lb/A was applied when furrows were closed. Weeds were controlled with normal cultivation and a broadcast application of Lasso at 2 qt/A and Lorox at 2 lb/A on May 9 and of Eptam at 33 lb/A on June 16. Foliar sprays were applied as needed for insect and disease control. Plots received approximately one inch of water by overhead sprinkler irrigation on June 27 to supplement rainfall. Plants were rotocut on September 8 and tubers harvested on September 9.

Forty tubers, or all if less than 40 were available, from each 10-hill plot were washed and examined for scab lesions. Each tuber was scored 0 (no lesions) to 4 (deep pits) for type of scab present and 0 (no scab) to 5 (61% or more) for surface area covered by scab lesions. These values were converted to individual tuber indices that ranged from 0 (no scab) to 140 (61% or more of surface area covered by deep pitted scab). The scab index for each plot was calculated by dividing the sum of the individual tuber indices by the number of tubers examined. The index for each cultivar and breeding line in the replicated trial was determined by calculating the average of the two plots. A scab index ratio was calculated for each cultivar and breeding line by dividing the index of the cultivar or breeding line by the index of their respectively paired Chippewa plots and multiplying the quotient by 100. The ratio allows one to determine quickly which cultivars or breeding lines were more or less resistant to scab than Chippewa and to compare one with another.

Approximately 5.5 inches of rain fell during the months of May and June, resulting in lower than normal soil moisture during and shortly after tuberset for most cultivars and breeding lines. Environmental conditions were favorable for scab during the early stages of tuber development. Scab severity seemed to vary somewhat throughout the field. The cultivars and breeding lines that appeared highly resistant (having a scab index ratio of 4.0 or less) were Campbell 13, AF92-3, W564-3A, P0008-1, P0011-3, P0014-2, P0024-1 and T6-21.

Results of breeding lines and cultivars of potatoes grown in soils that were infested with *Streptomyces scabies* at Riverhead, New York in 1980

Cultivar or breeding line	Scab index			Type of scab on affected tubers: Majority of lesions		Type of scab on affected tubers: Average lesion		% tubers with scab	
	line	Chipp-ewa	ratio[1/]	line	Chipp-ewa	line	Chipp-ewa	line	Chipp-ewa
	10-hill, non-replicated, 40 tubers:								
Allagash Russet	0.2	2.5	8.0	2	2	2.0	2.3	10.0	35.0
Belrus	0.9	2.5	36.0	2	2	2.0	2.2	35.3	50.0
Butte	0.5	4.7	10.6	2	2	2.0	2.0	12.5	54.8
Campbell 11	2.0	1.1	181.8	2	2	2.2	2.5	44.0	20.5
Campbell 13	0.2	5.3	3.8	2	2-3	2.0	2.4	10.0	52.5
Hudson	1.3	2.3	56.5	2	2	2.0	2.0	33.3	40.5
Jemseg	0.4	3.8	10.5	2	2	2.0	2.1	22.5	62.5
Kennebec	1.2	2.2	54.5	2	2	2.0	2.1	42.5	50.0
Michimac	3.4	5.3	64.2	2	2	2.1	2.2	67.5	70.0
Peconic	3.5	7.8	44.9	2-3	2-3	2.2	2.2	67.5	90.0
Russet Burbank	0.8	8.6	9.3	2	2-3	2.0	2.2	14.3	87.5
Superior	1.0	7.8	12.8	2	2	1.9	2.1	35.0	82.5
Wauseon	0.8	5.4	14.8	2	2	2.0	2.2	25.0	82.5
A68678-1	0.8	10.3	7.8	2	2-3	2.0	2.2	30.0	94.7
AF92-3	0.2	5.6	3.6	2	2	2.3	2.0	7.7	73.0
AF186-5	1.8	8.6	20.9	2-3	2	2.1	2.1	52.5	90.0
AF205-9	2.3	6.9	33.3	2	2	2.0	2.2	69.2	85.2
B7583-6	2.8	8.6	32.6	2	2-3	2.0	2.2	59.4	90.0
B7802-2	3.6	10.2	35.3	2	2	2.1	2.2	50.0	87.5
C7358-14A	2.4	8.4	28.6	2	2-3	2.0	2.1	55.0	87.1
CA02-7	1.5	16.2	9.2	2	2-3	2.2	2.3	21.4	95.0
W564-3A	0.1	11.0	0.9	2	2-3	2.0	2.2	2.5	90.0
AF236-1	5.8	11.0	52.7	2	2	2.0	2.2	75.8	100
AF307-5	11.0	13.6	80.9	2-3	2-3	2.2	2.2	100	92.3

Cultivar or breeding line	Scab index			Type of scab on affected tubers: Majority of lesions		Type of scab on affected tubers: Average lesion		% tubers with scab	
	line	Chipp-ewa	ratio	line	Chipp-ewa	line	Chipp-ewa	line	Chipp-ewa
F68036	6.5	9.2	70.6	2-3	2	2.3	2.2	79.2	80.8
F71076	19.7	9.8	201.0	2-3	2	2.6	2.0	100	94.3
F73068	8.8	11.4	77.2	2	2-3	2.1	2.3	96.4	85.7
F73092	16.3	11.8	138.1	2-3	2-3	2.3	2.3	100	87.5
F73099	3.8	15.6	24.4	2	2-3	2.0	2.4	75.0	90.0
F74016	9.8	5.6	175.0	2	2	2.2	2.2	97.5	70.0
F74123	17.8	8.8	202.3	3	2-3	2.6	2.2	95.0	82.5
F75009	2.0	10.0	20.0	2	2	2.0	2.3	52.5	87.5
F75040	0.8	11.6	6.9	2	2	2.0	2.3	37.5	92.5
6788-1	2.0	10.2	19.6	2	2-3	2.1	2.2	43.8	80.0
B6987-184	4.0	8.2	48.8	2	2	2.1	2.1	67.5	92.5
B7592-1	0.8	10.9	7.3	2	2-3	2.0	2.3	10.0	85.0
B8491-1	2.3	8.2	28.0	2	2	1.8	2.0	58.3	87.5
B8491-24	3.9	9.7	40.2	2	2	2.3	2.2	57.9	95.0
B8713-24	6.2	3.8	163.2	2	2	2.1	2.1	92.5	85.0
B8751-6	8.6	11.1	77.5	2-3	2-3	2.8	2.3	62.5	95.0
B8832-3	0.6	4.4	13.6	2	2	2.3	2.0	20.6	72.5
B8847-8	1.0	9.7	10.3	2	2	2.0	2.3	31.4	95.0
B8871-6	7.0	6.0	116.7	2-3	2	2.6	2.1	75.0	75.0
B8887-1	1.6	13.2	12.1	2	2-3	2.0	2.4	42.5	82.5
B8914-8	2.5	6.8	36.8	2	2-3	2.0	2.2	52.5	75.0
B8934-4	11.2	8.6	130.2	2	2	2.2	2.1	100	85.0
B8972-1	4.6	6.9	66.7	2	2-3	2.1	2.2	91.4	94.1
B8983-5	5.8	10.7	54.2	2	2	2.0	2.2	72.5	85.0
B9016-20	3.8	8.4	45.2	2	2	2.2	2.2	70.0	92.5
B9010-14	6.6	7.8	84.6	2	2-3	2.1	2.2	57.1	77.5
B9097-5	1.4	8.8	15.9	2	2	2.1	2.2	27.5	95.0
B9099-5	14.5	5.7	254.4	2-3	2-3	2.2	2.2	96.6	67.5
B9326-1	10.9	10.1	107.9	3-4	2-3	3.3	2.3	62.5	85.0
CF7508-1	1.3	7.1	18.3	2	2-3	2.0	2.4	42.5	70.0
CF7608-8	0.8	8.8	9.1	2	2-3	2.0	2.4	22.5	95.0
CF74135-3	8.0	10.8	74.1	2-3	2-3	2.5	2.4	87.5	87.5
CF76183-2	2.3	7.3	31.5	2	2-3	2.0	2.4	47.2	83.9

Cultivar or breeding line	Scab index			Type of scab on affected tubers: Majority of lesions		Type of scab on affected tubers: Average lesion		% tubers with scab	
	line	Chipp-ewa	ratio	line	Chipp-ewa	line	Chipp-ewa	line	Chipp-ewa
P0005-1	4.2	4.6	91.3	2-3	2-3	2.5	2.5	53.1	68.4
P0008-1	0.0	2.5	0.0	0	2	0.0	2.2	0.0	50.0
P0011-3	0.0	3.4	0.0	0	2	0.0	2.1	0.0	83.9
P0013-5	0.3	1.1	27.3	2	2	2.0	2.5	12.1	20.5
P0014-2	0.0	3.4	0.0	0	2-3	0.0	2.2	0.0	75.7
P0017-2	1.3	2.3	56.5	2	2	2.0	2.0	12.5	40.5
P0021-3	0.2	3.4	5.9	2	2	2.0	2.2	10.5	64.9
P0021-4	0.6	2.2	27.3	2	2	2.0	2.1	12.5	50.0
P0024-1	0.2	6.4	3.1	2	2-3	2.0	2.3	9.5	82.8
P0028-1	2.2	7.8	28.2	2-3	2-3	2.3	2.2	55.0	90.0
P0030-2	1.5	7.0	21.4	2	2-3	2.2	2.4	42.5	70.0
P0035-1	5.0	7.8	64.1	2	2	2.0	2.1	95.0	82.5
8NW-8	1.8	8.5	21.2	2	2	2.1	2.4	51.3	78.3
8TB-8	9.7	10.3	94.2	2-3	2-3	2.2	2.2	75.7	94.7
8TW-2	6.8	9.8	69.4	2-3	2-3	2.3	2.6	82.4	97.4
8XM-5	12.5	8.6	145.3	2-3	2	2.3	2.1	95.0	90.0
8YW-1	3.0	9.4	31.9	2	2-3	2.1	2.2	67.5	87.5
8YY-1	16.5	8.6	191.9	2-3	2-3	2.2	2.2	100	90.0
8YY-3	4.2	7.3	57.5	2	2-3	2.0	2.4	77.5	87.5
9AM-3	4.5	8.4	53.6	2	2	2.1	2.1	67.5	87.1
9BJ-2	2.0	6.6	30.3	2	2	2.0	2.2	60.0	91.2
9FM-1	3.9	11.0	35.4	2	2-3	2.0	2.2	78.3	90.0
9GE-1	2.9	10.5	27.6	2	2-3	2.1	2.6	52.5	87.2
9GPA-1	3.2	13.6	23.5	2	2-3	2.0	2.2	65.0	92.3
9HB-2	5.0	7.8	64.1	2	2	2.0	2.0	87.5	100
9HG-1	8.0	9.8	81.6	2-3	2	2.2	2.0	97.4	94.3
9HU-2	3.7	9.0	41.1	2	2	2.2	2.3	50.0	89.6
9HX-1	24.0	11.8	203.4	2-3	2-3	2.6	2.3	100	87.5
9HZ-3	5.4	13.4	40.3	2-3	2-3	2.4	2.3	75.0	84.4
9II-1	9.2	5.6	164.3	2-3	2-3	2.5	2.2	77.5	70.0
9JJ-2	1.9	7.3	26.0	2	2-3	2.0	2.2	50.0	87.1
9LE-3	5.6	10.0	56.0	2	2	2.0	2.3	77.5	87.5
9LV-1	2.6	6.5	40.0	2	2	2.2	2.2	62.5	87.5
9LV-2	3.1	10.2	30.4	2	2	2.0	2.2	82.5	80.0

Cultivar or breeding line	Scab index			Type of scab on affected tubers: Majority of lesions		Type of scab on affected tubers: Average lesion		% tubers with scab	
	line	Chipp-ewa	ratio	line	Chipp-ewa	line	Chipp-ewa	line	Chipp-ewa
9LY-2	2.2	5.8	37.9	2	2	2.2	2.2	50.0	90.0
9LY-4	2.3	8.2	28.0	2	2	2.1	2.0	72.5	87.5
9MB-1	2.6	7.6	34.2	2	2-3	2.1	2.5	65.0	87.5
9MB-3	2.4	4.4	54.5	2	2	2.0	2.0	77.5	72.5
T2-2	5.6	7.0	80.0	2	2	2.1	2.2	90.0	87.5
T3-2	10.0	6.0	166.7	2-3	2	2.3	2.1	97.5	75.0
T4-20	5.0	6.8	73.5	2	2	2.2	2.3	87.5	82.5
T4-26	16.4	6.8	241.2	2-3	2	2.8	2.2	92.5	75.0
T4-54	9.4	7.4	127.0	2-3	2	2.8	2.3	90.0	90.0
T4-74	6.2	8.6	72.1	2-3	2	2.5	2.1	82.5	85.0
T4-84	20.6	9.0	228.9	3	2	3.0	2.3	95.0	90.0
T5-8	5.8	10.7	54.2	2	2	2.1	2.2	90.0	85.0
T5-10	3.0	9.5	31.6	2	2	2.1	2.3	67.5	77.1
T5-16	1.5	7.8	19.2	2	2	2.2	2.2	52.5	77.5
T5-24	2.2	10.4	21.1	2	2-3	2.0	2.3	57.5	90.0
T6-21	0.2	5.7	3.5	2	2-3	2.0	2.3	12.5	67.5
T7-16	2.6	7.0	37.1	2	2	2.1	2.3	80.0	82.5
T11-29	3.6	3.8	94.7	2	2	2.1	2.1	82.5	85.0
T11-53	3.8	7.6	50.0	2	2-3	2.2	2.4	75.0	80.0
T12-27	6.8	7.1	95.8	2	2-3	2.2	2.4	80.0	70.0
T12-54	1.4	7.0	20.0	2	2	2.0	2.3	57.5	92.5
T12-72	2.8	10.8	25.9	2	2-3	2.0	2.4	77.5	87.5
T12-76	2.7	11.6	23.3	2	2-3	2.1	2.4	67.5	92.5
T14-20	0.9	4.6	19.6	2	2-3	2.0	2.5	40.0	68.4
T16-40	2.3	7.9	29.1	2	2-3	2.0	2.4	58.3	84.6
T20-5	6.6	7.0	94.3	2-3	2-3	2.4	2.3	82.5	82.5
T23-9	2.9	12.4	23.4	2	2-3	2.0	2.6	60.5	90.0
T24-37	1.9	7.6	25.0	2-3	2-3	2.5	2.4	45.0	80.0
T30-21	4.8	8.9	53.9	2	2	2.2	2.3	72.5	94.7
T30-36	4.4	7.0	62.8	2	2	2.0	2.3	82.5	92.5
T30-47	4.2	8.8	47.7	2	2-3	2.1	2.5	77.5	92.5
T30-70	10.0	11.6	86.2	2	2-3	2.2	2.4	92.5	92.5
T30-71	8.0	9.0	88.9	2	2-3	2.2	2.4	85.0	95.0

Cultivar or breeding line	Scab index			Type of scab on affected tubers: Majority of lesions		Type of scab on affected tubers: Average lesion		% tubers with scab	
	line	Chipp-ewa	ratio	line	Chipp-ewa	line	Chipp-ewa	line	Chipp-ewa
T31-38	4.8	7.9	60.8	2	2-3	2.3	2.4	80.0	84.6
T31-47	11.4	10.3	110.7	2	2-3	2.3	2.5	96.6	95.0
T31-67	5.6	8.8	63.6	2	2-3	2.3	2.4	64.9	85.0
T32-16	3.2	8.1	39.5	2	2-3	2.2	2.6	62.5	86.8
T37-29	4.3	10.4	41.3	2-3	2	2.3	2.2	85.0	87.5
T39-8	3.0	4.4	68.2	2-3	2	2.5	2.2	57.5	73.5
T44-11	1.7	8.8	19.3	2	2	2.0	2.2	61.1	87.5
T44-39	2.2	6.0	36.7	2	2	2.2	2.2	55.0	73.3
T44-40	7.6	8.0	95.0	2	2-3	2.1	2.5	100	67.5
T45-27	1.7	6.6	25.8	2	2	2.0	2.2	61.5	75.0
T45-35	1.8	5.2	19.2	2	2	2.1	2.2	57.5	65.0
T46-32	4.2	6.7	62.7	2	2	2.1	2.1	90.0	94.7
T48-20	4.6	4.3	107.0	2	2	2.0	2.2	85.0	76.7
T53-24	1.2	8.8	13.6	2	2	2.0	2.3	42.5	88.9
T53-26	0.7	7.8	9.0	2	2	2.0	2.3	27.5	75.0
T53-47	4.9	10.5	46.7	2	2	2.2	2.3	70.0	91.7
T53-48	5.6	9.0	62.2	2	2	2.2	2.3	85.0	80.0
T53-77	19.3	14.1	136.9	3	2	2.9	2.3	97.5	87.5
T55-49	1.8	9.4	19.1	2	2	2.1	2.2	55.0	85.0
T57-1	2.5	18.4	13.6	2	2-3	2.0	2.4	72.5	94.7
T65-9	5.3	13.0	40.8	2	2	2.2	2.2	72.5	90.0
T66-4	4.5	13.7	32.8	2	2-3	2.0	2.4	90.0	90.0
T88-6	1.2	6.0	20.0	2	2	2.0	2.1	45.0	77.5
T88-22	1.2	15.0	8.0	2	2-3	2.0	2.5	45.0	91.2
T89-5	11.8	6.8	173.5	2-3	2	2.5	2.3	95.0	87.5
T89-20	3.7	10.2	36.3	2	2	2.2	2.2	60.0	96.9
T98-6	2.0	10.2	19.6	2	2	2.1	2.3	52.5	86.1
T272-32	4.0	10.8	37.0	2	2	2.0	2.3	82.5	88.5
T275-100	4.9	6.8	72.0	2	2	2.1	2.3	75.0	88.9

Cultivar or breeding line	Scab index			Type of scab on affected tubers: Majority of lesions		Type of scab on affected tubers: Average lesion		% tubers with scab	
	line	Chippewa	ratio	line	Chippewa	line	Chippewa	line	Chippewa
10-hill, 2 replications, 80 tubers:									
NY 59	4.2	7.6	55.3	2	2	2.3	2.2	66.2	93.8
NY 59	1.8	4.6	39.1	2	2	2.2	2.2	51.2	82.5
NY 59	6.2	8.3	74.7	2-3	2-3	2.4	2.4	63.8	93.2
NY 61	7.4	9.3	79.6	2	2	2.2	2.3	97.5	85.6
NY 61	9.8	9.5	103.2	2	2	2.2	2.2	88.8	83.8
NY 61	8.3	11.0	75.4	2	2	2.2	2.2	93.6	90.0
NY 63	4.4	6.9	63.8	2-3	2	2.4	2.2	73.8	87.0
NY 63	6.8	8.2	82.9	2	2-3	2.2	2.2	78.8	86.2
NY 63	8.3	8.5	97.6	2	2	2.2	2.4	90.0	86.0
NY 66	1.8	6.7	26.9	2	2	2.1	2.3	38.8	80.0
Q54-6	5.0	6.9	72.5	2	2-3	2.3	2.4	78.4	78.8
Q54-6	5.9	6.8	86.8	2	2	2.3	2.2	71.2	89.4
Q54-6	2.9	7.0	41.4	2	2-3	2.3	2.4	56.2	76.0
Q54-11	3.9	8.4	46.4	2	2	2.1	2.2	71.2	87.3
Q155-3	4.8	5.0	96.0	2	2	2.3	2.3	82.5	76.2
4Q71-12	6.3	8.9	70.8	2	2-3	2.2	2.4	86.2	82.5
R471-62	2.4	5.2	46.2	2	2	2.0	2.2	55.0	85.0
S303-8	3.2	9.8	32.6	2	2	2.2	2.4	70.0	85.4
S374-4	5.1	6.3	81.0	2	2	2.2	2.2	76.6	77.5
S376-1	3.4	9.4	36.2	2	2	2.0	2.2	65.0	81.0
S376-2	2.0	7.4	27.0	2	2-3	2.0	2.4	60.0	75.0
S377-8	2.4	6.0	40.0	2	2-3	2.1	2.4	55.0	82.1
S377-41	3.1	8.6	36.0	2	2	2.0	2.3	76.2	82.9
S377-59	1.6	5.9	27.1	2	2	2.1	2.2	42.8	76.9

1/ Ratio= index for cultivar or breeding line divided by index of paired Chippewa, multiplied by 100

NEW YORK STATE

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Results of Potato Variety Trials in Upstate New York

1979-1980

One hundred and four clones were entered in ten replicated experiments in upstate New York by the Vegetable Crops Department in 1980. Six were conducted at the Thompson Vegetable Research Farm at Freeville, New York, on a Howard gravelly loam, two in Wyoming County on mineral soil near Gainesville, New York, and two on muck soil in Orleans County near Elba, New York. One hundred and forty seven clones were entered in two unreplicated observational trials at Freeville, New York.

Field data for 1980 are listed in Tables 1-12. Noteworthy round whites include Denali, Crystal, Michibonne, Michimac, Rosa (NY61), B8715-22, B9016-20, BR7093-23, NY59, S376-2, S377-8, and S377-41. Promising reds are Rideau and ND9403-16R.

Russet clones with high specific gravity and significantly higher marketable yields than the standard Russet Burbank are A68678-1 (Lemhi) and B7583-6 (Russette), however, they both had a high percentage of tubers with hollow heart.

In replicated fertilizer experiments yield of five white skinned and two russeted clones was not affected when nitrogen rates were increased above the base level. In fact, yields of Rosa (NY61), Russette (B7583-6) and B6987-184 were higher at 75 lbs N/A than at 112 or 150 lbs N/A. Belchip and NY59 did not respond to N rates above 100 lbs/A. The standard recommendation of 150 lbs N/A for BelRus, and Monona resulted in yields which were as high as an application of 150 lbs N/A at planting and a sidedress application of 60 lbs N/A when the plants were 4 to 6" tall.

Storage data for 1979 are listed in Tables 13-14. Clones with potato chip market potential are Atlantic. Peconic, Rosa (NY61), B6987-184, B7592-1, B8491-1, B8779-1, B8799-8, B8887-1, BR7093-23, C7232-4, Q94-9, Q94-25, Q155-3, and 4Q61-8.

After-cooking darkening was not a major problem in 1979. However, AF186-5, B6987-184, B8779-1, and BR7093-23 had significantly lower ratings than other clones tested.

Clones that lost more than 10% of total weight due to the combination of sprout weight and general shrinkage are Atlantic, BelRus, Katahdin, Rosa (NY61), AF186-5, B7154-6, B7200-33, B8491-24, B8687-22, B8706-7, B8710-1, B8779-1, B8783-6, B8799-8, B8922-10, B9053-6, Q54-6, and R471-62.

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Upstate New York Table 1. Tuber characteristics of clones in replicated trials, 1980

Clone	Color	Texture	Shape	Depth	Clone	Color	Texture	Shape	Depth
Atlantic	Bu	SN	R-O	MT	B8783-1	W	RS	R-O	MT
Belchip	W	RS	O-R	F	B8783-5	W	RS	O-R	SF
BelRus	B	M-HR	O-L	SF	B8798-20	W	S	R	R
Chieftain	MR	RS	R-O	MT	B8799-8	BW	VS	O-R	SF
Crystal	W	S	R-O	MT	B8832-3	Bu	SN	R	R
Dakchip	W	S	R-O	SF	B8881-5	B	MR	O	R
Denali	W-Bu	RS	R-O	MT	B8887-1	Bu	SN	R	MT
Jemseg	Bu	SN	O-R	SF	B8922-10	B	LR	L	R
Katahdin	W	S	R-O	SF	B8934-4	B	MR	O	R
Michibonne	W	RS	R-O	MT	B8943-4	B	MR	L	MT
Michimac	W	S	R	SF	B8977-2	B	MR	O	SF
Monona	W	S	R-O	SF	B8983-5	W	RS	O-R	SF
Norchip	W	S	R	MT	B9016-20	Bu	SN	O	SF
Norland	MR	S	R-O	SF	B9019-14	Bu	SN	O-R	MT
Rideau	MR	RS	R-O	SF	B9020-18	B	MR	O	SF
Rosa (NY61)	W-PK	S	R-O	SF	B9062-5	W	RS	R-O	MT
Russet Burbank	B	MR	L	R	B9097-5	Bu	SN	O-R	SF
Superior	Bu	SN	O-R	SF	B9099-5	Bu	SN	R-O	MT
Trent	W	RS	O	SF	BR7093-23	W	S	R-O	MT
Wauseon	W	S	R-O	SF	C7232-4	W	S	O	SF
A68678-1	B	MR	L	MT	CA02-7	W	RS	R	R
AF186-5	Bu	SN	O	MT	ND146-4R	BR	S	R	MT
AF205-9	B	MR	L	SF	ND9403-16R	BR	S	O-R	MT
B6987-184	Bu	SN	O	SF	NY59	W	RS	R	MT
B7151-4	Bu	SN	R-O	SF	NY63	W	S	R	MT
B7583-6	B	MR	O	SF	NY66	B-Bu	SN	R	MT
B7592-1	W	RS	O	MT	Q54-6	W	RS	R	MT
B7805-1	W	S	R	R	Q54-11	W	RS	R-O	SF
B8491-1	W-Bu	RS	O-R	SF	Q155-3	BW	S	O-R	SF
B8491-24	W	RS	R	SF	R471-62	Bu	RS	O-R	SF
B8514-8	W	RS	O-R	MT	S374-4	Bu	SN	R-O	MT
B8706-7	Bu	SN	R	MT	S376-1	Bu	SN	R	SF
B8715-22	W	S	O	SF	S376-2	Bu	SN	R	MT
B8751-6	Bu	RS	O-R	SF	S377-8	Bu	SN	R	R
B8771-6	W	RS	O	SF	S377-41	Bu	SN	R	R

Abbreviations

Color - B=brown, BR=bright red, Bu=buff, BW=bright white, MR=medium red, PK=pink, W=white

Texture - HR=heavy russet, MR=medium russet, RS=relatively smooth, SN=slight net, S=smooth

Shape - O=oblong, L=long, R=round

Depth - F=flat, MT=medium thick, R=round, SF=slightly flattened

New York Table 2. Variety Trial 1, Cornell Resistant Clones, Freeville, New York, 1980

Clone[1/]	Yield (cwt/A) Total	Yield (cwt/A) US #1 1⅞-4	% Kat Yield 1⅞-4	% of Total Yield US No. 1 1⅞-2½	% of Total Yield US No. 1 2½-3¼	% of Total Yield US No. 1 3¼-4	% of Total Yield US No. 1 >4	% of Total Yield Defects[2/]	MTW[3/] (oz)	Spec[4/] Grav	HH[5/]	App[6/]	Vine[7/] Mat
Rosa (NY61)	554	516	149	17	58	19	0	3	5.5	77	2	7.0	7
S377-41	518	457	132	11	53	25	1	8	6.1	77	1	9.0	7
S376-2	473	436	126	15	55	23	2	3	5.4	69	0	7.0	6
S377-8	460	430	125	19	58	16	0	1	4.6	66	0	8.8	6
Q54-6	445	417	121	10	58	25	0	2	5.6	78	1	7.3	8
Q155-3	430	398	115	13	57	23	1	3	5.7	69	3	8.3	6
NY59	415	390	113	13	49	32	2	1	5.8	75	0	7.0	9
NY63	432	382	111	10	40	38	3	8	7.4	69	1	7.5	6
NY66	444	378	110	6	36	44	4	8	7.2	76	0	7.0	6
S376-1	378	348	101	17	56	19	1	3	5.2	78	0	7.5	7
Katahdin	391	345	100	8	46	34	3	5	6.9	69	0	7.3	7
S374-4	378	321	93	25	51	8	0	10(S)	4.4	65	1	7.0	7
Waller-Duncan (.05)	(93)	(98)							(1.0)	(4)			

1/ Planted May 16, 1980, harvested September 19, 1980, within row spacing 9.8". Fertilizer applied at a rate of 1154 lb/A of 13-13-13 in bands at time of planting, between row spacing 34".

2/ Defects = Total of all defects. Defects >7% in parenthesis with the major defects listed first. Abbreviations: S = sunburn, M = misshapen, G = growth cracks.

3/ MTW = Mean tuber weight in ounces.

4/ Spec Grav = Specific gravity determined by hydrometer with 1.0 omitted.

5/ HH = Number of tubers with hollow heart and/or brown center of 40 tubers cut (10 per replication).

6/ App = Appearance rating based on a scale of 1 to 9; 1 = extremely rough unattractive, 9 = smooth attractive.

7/ Vine maturity rated on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous.

Upstate New York Table 3. Variety Trial 2, Freeville, New York, 1980

Clone[1]	Yield (cwt/A) Total	US#1 1⅞-4	% Kat Yield 1⅞-4	% of Total Yield 1⅞-2½	2½-3¼	3¼-4	>4	Defects[2]	MTW[3] (oz)	Spec[4] Grav	HH[5]	App[6]	Vine[7] Mat
Michibonne	519	468	133	7	40	44	3	5	7.7	76	0	7.0	8
Denali	467	439	124	17	63	14	0	3	6.1	92	6	8.3	8
Michimac	460	414	118	10	46	34	2	6	7.0	73	4	7.5	7
Crystal	489	414	118	13	59	13	0	13	6.2	82	11	7.8	7
BR7093-23	454	407	115	14	45	31	1	6	6.5	75	2	7.3	8
Dakchip	488	407	115	10	45	29	1	12	6.3	73	0	7.0	6
Monona	400	383	109	13	59	24	1	2	6.3	69	8	6.5	6
Atlantic	437	382	108	10	45	32	2	8	6.5	89	8	7.8	7
Belchip	407	381	108	10	55	28	1	3	6.4	89	1	7.0	8
Norchip	447	355	100	11	46	22	1	17(S)	6.1	80	6	8.0	6
Katahdin	407	354	100	9	43	36	2	7	6.8	75	5	7.3	7
AF205-9	398	333	95	36	47	1	0	9(M)	5.5	84	1	7.0	9
CA02-7	323	294	83	16	56	18	0	4	5.4	78	12	6.8	8
AF186-5	295	273	78	21	62	10	0	3	5.4	77	2	8.0	7
Waller-Duncan (.05)	(55)	(53)							(0.6)				

Upstate New York Table 4. Variety Trial 3, Early White, Freeville, New York, 1980

Clone[8]	Yield (cwt/A) Total	US #1 1⅞-4	% Sup Yield 1⅞-4	% Total Yield US No. 1 1⅞-2½	2½-3¼	3¼-4	>4	Defects[2]	MTW[3] (oz)	Spec[4] Grav	HH[5]	App[6]	Vine[7] Mat
B8715-22	462	441	103	15	70	11	0	2	5.4	65	0	9.0	6
Superior	465	428	100	10	58	24	1	5	6.1	72	0	6.8	7
B8887-1	432	395	93	26	60	5	0	3	4.4	81	2	7.3	7
B8771-6	405	373	88	9	53	30	3	3	7.3	75	4	7.8	7
C7232-4	392	368	86	14	64	17	0	4	6.2	71	0	7.5	6
Trent	360	348	82	17	70	10	0	1	5.7	90	2	8.5	9
B8491-24	416	345	81	9	37	37	11	4	7.4	70	1	7.0	8
B9097-5	360	333	78	15	58	20	1	3	5.9	75	2	7.5	4
B9062-5	365	328	76	16	61	13	0	6	5.7	74	0	7.5	4
Jemseg	396	314	73	6	40	33	6	13	8.1	68	7	6.8	5
B8783-6	323	292	68	26	56	8	0	3	4.3	78	0	8.8	4
B8751-6	297	273	64	36	52	5	0	1	4.1	72	0	9.0	3
B8799-8	281	267	63	29	61	6	0	1	4.9	77	1	9.0	3
Waller-Duncan (.05)	(54)	(52)							(0.5)	(4)			

[1] Planted May 16, 1980, harvested September 19, 1980, within row spacing 9.7". See footnote 1, Table 2.

[2]- [7] See appropriate footnotes, Table 2.

[8] Planted May 16, 1980, harvested September 4, 1980, within row spacing 9.9". See footnote 1, Table 2.

Upstate New York Table 5. Variety Trial 4, Freeville, New York, 1980

Clone[1]	Yield (cwt/A) Total	Yield (cwt/A) US #1 1⅞-4	% Kat Yield 1⅞-4	% of Total Yield US No. 1 1⅞-2½	2½-3¼	3¼-4	>4	Defects[2]	MTW[3] (oz)	Spec[4] Grav	HH[5]	App[6]	Vine[7] Mat
B9016-20	474	452	117	9	56	30	0	4	7.2	64	1	7.0	6
Katahdin	451	389	100	9	43	35	3	10(S)	7.2	69	10	7.3	7
B7592-1	413	372	96	19	59	12	3	5	6.2	78	2	7.0	8
B8514-8	420	370	95	11	49	29	1	9	7.0	75	2	7.0	8
B6987-184	400	368	95	22	62	9	1	4	5.8	89	12	7.0	8
B7805-1	403	357	92	5	35	49	4	6	8.1	67	1	8.8	5
B9019-14	404	351	90	18	51	17	1	8	5.5	68	4	8.5	5
B8983-5	369	300	78	15	41	26	1	15(G)	6.0	83	0	7.7	6
B9099-5	336	299	78	15	49	24	0	7	5.7	73	0	7.8	5
B7151-4	353	294	77	9	54	20	0	16(M)	6.8	85	28	5.5	8
B8491-1	284	209	54	13	42	19	1	20(M)	6.2	72	12	5.8	7
B8783-1	206	176	45	24	41	19	0	7	4.8	68	0	7.8	2
B8832-3	187	169	43	31	47	12	0	2	4.0	79	1	7.5	3
Waller-Duncan (.05)	(51)	(54)							(0.7)	(4)			
Other[8]													
B8706-7	447	381	98	7	36	42	3	11	7.4	71	4	6.0	6
B8798-20	330	318	79	12	50	35	0	2	6.9	77	5	8.0	7

Upstate New York Table 6. Red Variety Trial, Freeville, New York, 1980

Clone[9]	Yield (cwt/A) Total	Yield (cwt/A) US #1 1⅞-4	% of Total Yield US No. 1 1⅞-2½	2½-3¼	3¼-4	>4	Defects[2]	MTW[3] (oz)	Spec[4] Grav	HH[5]	App[6]	Vine[7] Mat
ND9403-16R	467	440	20	61	13	0	3	5.6	79	0	7.3	5
Chieftain	449	434	15	61	21	1	0	5.6	72	0	7.8	5
Rideau	399	385	11	65	21	1	2	6.4	81	0	8.0	7
ND146-4R	331	308	29	53	10	0	1	4.4	65	0	8.0	3
Norland	312	277	19	61	9	0	6	5.1	64	0	7.8	3
Waller-Duncan (.05)	(86)	(76)						(0.2)	(6)			

[1] Planted May 19, 1980, harvested September 25, 1980, within row spacing 9.6". See footnote 1, Table 2.

[2]-[7] See appropriate footnotes, Table 2.

[8] Not included in analysis of variance. Hollow heart based on 20 tubers of B8706-7 and 30 tubers of B8798-20.

[9] Planted May 19, 1980, harvested September 16, 1980, within row spacing 9.7". See footnote 1, Table 2.

Upstate New York Table 7. Freeville Russet Variety Trial, Freeville, New York, 1980

Clone[1/]	Yield (cwt/A)		% of Total Yield									
			US No. 1									
			ounces									
	Total	US #1 4-16 oz	0-4	4-10	10-16	>16	Defects[2/]	MTW[3/] (oz)	Spec[4/] Grav	HH[5/]	App[6/]	Vine[7/] Mat
A68678-1	394	324	11	62	21	2	5	6.4	86	15	7.8	8
B7583-6	398	323	13	64	17	3	3	6.1	84	17	7.5	7
B9020-18	372	300	13	59	21	5	1	6.2	66	0	8.0	5
B8881-5	373	296	16	63	17	1	3	5.9	65	0	8.3	2
B8977-2	392	267	5	39	30	11	15(M)	8.4	71	28	5.8	7
B8922-10	335	265	18	63	17	1	2	5.6	69	1	8.0	4
R. Burbank	385	249	15	50	15	2	18(M)	6.4	83	7	4.8	8
B8943-4	319	240	11	62	14	0	13(M)	6.3	72	3	7.0	2
BelRus	280	216	21	67	10	0	3	5.7	79	1	8.8	3
B8934-4	310	208	14	50	17	2	17(M)	6.2	73	12	7.0	5
Waller-Duncan(.05)	(49)	(41)						(0.9)	(4)			

Upstate New York Table 8. Wyoming County Russet Variety Trial, Gainesville, New York, 1980

Clone[8/]	Yield (cwt/A)		% of Total Yield						
			US No. 1						
			ounces						
	Total	US #1 4-16 oz	0-4	4-16	>16	Defects[2/]	Spec[4/] Grav	HH[5/]	App[6/]
A68678-1	388	325	8	83	2	8(M)	85	3	8.3
B7583-6	333	298	4	90	1	5	83	0	8.3
BelRus	278	238	13	86	1	1	81	1	8.5
R. Burbank	338	227	6	67	0	27(M)	79	0	5.0
Waller-Duncan(.05)	(48)	(76)					(ns)		

Upstate New York Table 9. Orleans County Russet Variety Trial, Elba, New York, 1980

Clone[9/]	Yield (cwt/A)		% of Total Yield					
			US No. 1					
			ounces					
	Total	US #1 4-16 oz	0-4	4-16	>16	Defects[2/]	HH[5/]	App[6/]
A68678-1	259	196	17	77	0	6	0	8.8
B7583-6	245	188	17	77	0	6	0	8.5
R. Burbank	229	171	22	75	0	3	0	7.0
BelRus	152	118	20	78	0	2	0	9.0
Waller-Duncan(.05)	(54)	(32)						

1/ Planted May 12, 1980, harvested September 15, 1980, within row spacing 9.9" except for Russet Burbank 12". See footnote 1, Table 2.

2/-4/, 6/-7/ See appropriate footnotes, Table 2.

5/ Number of tubers with hollow heart and/or brown center of 40 tubers cut at Freeville, 20 at Gainesville and 10 at Elba.

8/ Planted June 2, 1980, harvested October 6, 1980, 1900 lb/A of liquid 8-16-8 applied in bands at time of planting.

9/ Planted May 28, 1980, harvested September 18, 1980, fertilizer broadcast at a rate of 750 lb/A of 10-20-20, vines sprayed with ametryn on 9/11/80.

Upstate New York Table 10. White Variety Trial, Gainesville, New York, 1980

Clone[1/]	Yield (cwt/A)		% Kat Yield	% of Total Yield				Spec[4/]		
		US #1		US No. 1						
	Total	1 7/8-4	1 7/8-4	1 7/8	1 1/8-4	4	Defects[2/]	Grav	HH[5/]	App[6/]
BR7093-23	415	361	102	5	87	1	7	79	1	8.5
Katahdin	387	357	100	2	92	2	4	75	0	7.3
R471-62	398	347	98	4	87	1	8(S)	74	1	8.0
Q155-3	399	346	98	4	87	0	9(S)	73	1	8.0
B7592-1	411	339	95	4	83	4	9(S)	79	0	8.3
Rosa	408	333	94	11	82	0	7	78	0	7.3
Denali	374	316	89	8	84	0	8(S)	95	1	8.0
Q54-11	372	316	89	5	85	0	10(S)	73	2	8.0
B6987-184	367	307	87	8	84	0	8(S)	94	1	7.5
Belchip	346	304	86	5	88	1	6	84	1	6.5
Atlantic	344	302	86	6	88	0	6	92	3	7.8
Monona	353	301	85	12	84	0	4	74	1	6.8
AF186-5	333	283	80	10	85	0	5	84	0	7.5
Norchip	342	268	75	9	78	1	12(S)	84	0	7.5
Jemseg	263	209	59	5	80	0	15(MG)	76	1	8.8
AF205-9	276	182	51	9	64	0	26(M)	83	0	6.8
Waller-Duncan(.05)	(51)	(53)						(4)		

Upstate New York Table 11. White Variety Trial on Muck Soil, Elba, New York, 1980

Clone[7/]	Yield (cwt/A)		% of Total Yield					
		US #1	US No. 1					
	Total	1 7/8-4	<1 7/8	1 7/8-4	>4	Defects[2/]	HH[5/]	App[6/]
NY59	349	292	11	83	3	3	0	9.0
Jemseg	296	246	5	83	4	8	1	9.0
Rosa	324	246	18	76	0	6	0	9.0
R471-62	276	237	10	86	0	4	0	8.0
Atlantic	284	225	16	79	0	5	0	8.3
Q54-11	256	218	11	86	0	3	0	9.0
Wauseon	262	212	12	82	0	6	0	9.0
B6987-184	256	202	17	79	0	4	0	8.0
Q155-3	222	192	10	86	0	4	0	8.8
Waller-Duncan(.05)	(40)	(48)						
Other[8/]								
Denali	340	291	12	86	0	2	0	9.0
BR7093-23	347	275	15	79	0	6	0	8.5

1/ See footnote 8, Table 8.

2/-4/, 6/ See appropriate footnotes, Table 2.

5/ See footnote 5, Table 7.

7/ See footnote 9, Table 9.

8/ Not included in analysis of variance.

Upstate New York Table 12. Effect of nitrogen rate on yield and quality of Belchip, BelRus, Monona, Rosa, B6987-184, B7583-6 and NY59, Freeville, New York, 1980

Clone and N rate (lb/A)[1]	Tuber No. per ft	Yield (cwt/A) Total	US #1 4-16 oz	% of Total Yield US No. 1 0-4	4-10	10-16	>16	Defects[2]	MTW[3] (oz)	Spec Grav[4]	HH[5]	Vine Mat[6]
BelRus												
150	6.0	304	222	21	60	13	4	3	5.3	76	2	3
180	5.6	291	222	16	60	16	3	5	5.5	78	6	3
210	5.6	296	233	14	63	16	5	2	5.5	78	2	3
Waller-Duncan (.05)	(ns)	(ns)	(ns)						(ns)	(ns)		

Clone and N rate (lb/A)[1]	Tuber No. per ft	Total	US #1 1⅞-4	% of Total Yield US No. 1 1½-1⅞	1⅞-2½	2½-3¼	3¼-4	>4	Defects[2]	MTW[3] (oz)	Spec Grav[4]	HH[5]	Vine Mat[6]
Belchip													
100	6.7	462	425	2	8	50	34	2	4	7.2	84		7
150	7.0	473	432	1	8	51	32	3	4	7.0	81		8
Waller-Duncan (.05)	(ns)	(ns)	(ns)							(ns)	(2)		
Monona													
150	3.3	418	391	2	9	51	33	1	3	13.1	69	6	5
180	3.1	427	398	2	10	51	32	2	3	14.5	71	7	6
210	3.0	420	391	3	8	52	33	2	2	14.8	70	4	6
Waller-Duncan (.05)	(ns)	(ns)	(ns)							(ns)	(ns)		
Rosa													
75	9.7	506	470	3	18	59	17	0	4	5.4	78	9	6
112	10.6	519	474	4	19	59	14	1	4	5.1	76	9	7
150	9.6	481	428	5	18	56	15	1	5	5.3	76	5	8
Waller-Duncan (.05)	(ns)	(ns)	(ns)							(ns)	(ns)		
B6987-184													
75	5.9	334	297	4	17	65	7	1	7	5.9	93	25	6
112	5.8	332	292	4	18	63	7	1	8	6.0	91	21	8
150	5.5	335	310	3	16	67	10	0	5	6.4	93	17	8
Waller-Duncan (.05)	(ns)	(ns)	(ns)							(ns)	(ns)		
B7583-6													
75	6.4	332	317	2	16	65	15	2		5.4	80	22	6
112	6.5	309	308	3	18	69	10	0		5.1	80	16	7
150	6.6	318	300	4	16	71	10	0		5.0	79	18	8
Waller-Duncan (.05)	(ns)	(ns)	(ns)							(ns)	(ns)		
NY59													
100	7.2	395	376	2	14	61	20	2	2	5.7	79		7
150	7.4	422	392	3	13	58	22	2	3	5.9	76		8
Waller-Duncan (.05)	(ns)	(ns)	(ns)							(ns)	(2)		

[1] Planting date for BelRus, Monona and Rosa was 5/12 and for Belchip, B6987-184, B7583-6 and NY59 was 5/15; harvest date for BelRus and Monona was 9/15, for Rosa, B6987-184, and B7583-6 was 9/19, and for Belchip and NY59 was 10/8.

[2]-[6] See appropriate footnotes, Table 2.

Upstate New York Table 13. 1979 Potato Variety Trials[1/], Chip Color Results[2/]

Clone	Trial I		Trial II		Trial III		Trial IV	Trial V		Steuben	
	50	45-60	50	45-60	50	45-60	50	50	45-60	Wh 50	Russ 50
Atlantic	46	47	49	53							
BelChip											
BelRus							42				38
Butte							31				25
Campbell-11	47	44									
Campbell-12										29	
Campbell-13										34	
Cent.Rus.							21				
Katahdin	35	35	38					36			
Kennebec	43	43									
MaineRus							48				44
Peconic	45	49									
R.Burbank							34				
Superior										34	
AF186-5	45	39									
AF205-9										44	
B6969-2										31	
B6987-184	49	46									
B7154-6			28								
B7200-33			26								
B7516-9					38						
B7583-6							34			31	
B7592-1			48	53							
B7802-2	33								41		
B7805-1			28								
B8352-3									30		
B8491-1			48	54							
B8491-24			33								
B8687-22					43	29					
B8706-7			45	43							
B8710-1			34								
B8710-16											
B8715-22			38								
B8751-6			43	41							
B8771-6			46	40							
B8779-1			47	44							
B8783-6			49	42							
B8799-8			52	50							
B8887-1			49	51							
B8922-10							25				
B8932-2*											
B9053-6					37						
BR7093-23	46	48									
CC26-1A					45	37					
C7232-4										52	
C7358-14A										42	
NY59	27							28			
NY61 (Rosa)	44	40						49	40		
NY63	26										
NY64	24										
NY65	43	46									
NY66	34										
Q53-5								38			
Q54-5								40			
Q54-6*								26			
Q54-11*								34			
Q94-9*								52	56		
Q94-25*								53	53		
Q155-3								54	52		
4Q61-8								45	45		
4Q61-12*								43	41		
4Q74-12								37			
R471-8								40			
R471-62*								48	39		
R471-89								36			
$D_{(.05)}$ Tukey	(8)	(8)	(9)	(11)	(10)		(8)	(9)	(7)	(10)	(7)

*Not included in analysis of variance.

1/ See 1978-1979 report for harvest results.

2/ Agtron M30 colorimeter readings. Standards for whole chips were discs 00 and 90 which were calibrated to give readings of 0 and 90 respectively. Minimum value for "generally acceptable color" for whole chips is about 45. Two slices of each of seventeen tubers per replication were fried in vegetable oil at 365°F. 50°F samples were stored at 50°F from time of harvest until fried 1/9/80. The 45-60°F samples were stored at 45°F from time of harvest until 2/21/80 when the temperature was raised to 60°F. Samples were fried on 3/20/80.

Upstate New York Table 14. 1979 Potato Variety Trials, Freeville, New York. After-cooking Darkening[1/] and Weight Loss Results[2/]

Clone	After-cooking darkening Variety Trial Number					Sprout weight or weight loss other than sprouts expressed as % of total weight Variety Trial Number									
						I		II		III		IV		V	
	I	II	III	IV	V	Spr	Oth	Spr	Oth	Spr	Oth	Spr	Oth	Spr	Oth
Atlantic	4.8	4.7				3.2	6.7	3.0	7.3						
BelRus				4.8								3.8	7.6		
Butte				4.8								1.8	6.4		
Campbell 11	5.0					2.5	5.5								
Cent. Rus.				4.9								3.4	5.5		
Katahdin	4.2	4.4	4.3		3.9	2.9	6.7	2.7	8.2	3.2	6.8			4.4	6.6
Kennebec	4.7					2.1	7.2								
Maine Rus				4.4								3.6	3.4		
Peconic	4.2					1.2	4.5								
R.Burbank				5.0								0.3	4.6		
AF186-5	3.9					5.7	9.2								
B6969-2															
B6987-184	3.4					3.4	4.1								
B7154-6		4.6						4.3	6.9						
B7200-33		4.9						4.8	7.6						
B7516-9			4.7							2.3	5.1				
B7583-6				4.1								0.1	4.9		
B7592-1		4.9						1.8	6.0						
B7802-2	5.0					0.6	5.6								
B7805-1		4.9						1.8	4.9						
B8352-3															
B8491-1		4.3						0.6	2.7						
B8491-24		4.7						3.4	8.2						
B8687-22			4.2							6.8	3.4				
B8706-7		4.5						3.0	8.5						
B8710-1		4.7						3.8	8.2						
B8710-16															
B8715-22		4.3						2.0	6.2						
B8751-6		4.9						1.7	6.8						
B8771-6		4.3						2.6	4.8						
B8779-1		3.9						5.3	7.1						
B8783-6		4.4						7.8	10.9						
B8799-8		4.7													
B8887-1		4.3						5.4	12.4						
B8922-10				4.2								3.3	6.8		
B8932-2															
B9053-6			4.2							9.4	2.7				
BR7093-23	3.8					0.6	5.6								
CC26-1A			4.1							4.0	5.9				
C7232-4															
NY59	5.0				5.0	0.9	4.2							1.0	3.5
NY61 (Rosa)	4.1				4.1	2.1	6.8							2.2	9.1
NY63	4.6					2.6	7.4								
NY64	4.7					1.1	4.6								
NY65	4.7					0.7	3.7								
NY66	5.0					2.1	3.2								
Q53-5					4.1									0.5	6.7
Q54-5					4.0									0.5	3.1
Q54-6*					4.3									5.4	7.6
Q54-11*					3.9									1.6	5.3
Q94-9*					4.3									1.0	7.3
Q94-25*					3.9									1.6	7.5
Q155-3					4.0									2.9	4.5
4Q61-8					4.6									0.9	7.8
4Q61-12*					4.8									0.7	6.4
4Q74-12					4.3									0.4	5.2
R471-8					4.5									0.7	4.3
R471-62*					4.5									6.6	7.1
R471-89					4.3									1.6	4.6
$D_{(.05)}$ Tukey	(0.8)	(0.8)	(0.7)		(0.8)	(1.0)	(8.4)	(1.6)	(6.0)	(1.7)	(ns)	(ns)	(ns)	(5.3)	(4.4)

*Not included in analysis of variance.

1/ Five tubers per each replication were peeled, on 1/16/80 dipped in 0.5% sodium bisulfite; cooked 7 min. in an autoclave at 15 p.s.i. and rated from 1-5, where 1 = severe after-cooking darkening, 5 = no darkening.

2/ Stored at 50°F from time of harvest. Data collected 3/7/80.

NEW YORK

R. L. Plaisted and H. D. Thurston[1]

New York Breeding Program

Early Generations. This year 99 crosses were made which are part of the variety development phase of the project. Fifteen are tuberosum x neotuberosum hybrids, the rest are crosses between tuberosum clones. All segregate for resistance to the golden nematode and many of them for scab and Verticillium wilt resistance. Additional crosses were made which mostly involve neotuberosum, sparsipilum, and/or berthaultii for heat tolerance, PVY, PVX, bacterial wilt, root knot, and glandular hairs. Sixty four thousand seedling tubers were saved from about 100,000 transplants. Forty seven thousand tuberosum x neotuberosum seedling hills segregating for resistance to the golden nematode, PVY and PVX, and 10,000 hills of tuberosum crosses from Campbell Soup segregating for golden nematode resistance were grown. From those, 6050 were selected. At the four hill level, 831 selections were made of the 5186 that were grown. At the next stage, 130 selections were made of 523 that were grown. Ninety six of the clones in the latter two stages were from the Campbell Soup Company.

Yield Trials. There were 57 clones in the first stage yield trials. The data for the 14 which have survived to date are presented in Table 1. The performance of clones in the more advanced yield trials at Ithaca, Riverhead, and Cato are presented in Tables 2, 3, and 4, respectively.

Variety Release. The clone NY61 will be released as the variety "Rosa", a name chosen to describe the pink color about the eyes, and to acknowledge its hybrid origin between South and North American varieties. It is resistant to the golden nematode, leaf roll, Verticillium wilt, and moderately resistant to early and late blight. It cooks white and produces light colored chips from 50° storage, comparable to Norchip. It produces a heavy set of small to medium sized tubers. Twenty two acres of Foundation seed were produced in 1980.

[1] In cooperation with Anderson, Brodie, Ewing, Fry, Jones, Sieczka, and Tingey.

Table 1. First Year Yield Trial Selections

Clone	Loc.	GN	V.W. Scab	Cwt/A Total	Cwt/A >1-7/8	Cwt/A >2-1/2	% >2-1/2 >1-7/8	#/20 hht.	#/20 int. necr.	Score	SG
Kat	I	S	3.8	362	350	271	77	0.5	0	3.0	1.071
	R			338	316	170	54	0	0.8	3.1	
T4-20	I	R	6	310	298	243	81	0	0	3.4	1.073
	R		74	291	281	148	53	0	0	3.6	
T5-10	I	R	5	354	314	196	63	0,0	0,0	4.2	1.073
	R		32	377	351	187	53	0	5	4	
T5-24	I	R	6	336	307	224	73	0	0	3.6	1.059
	R		21	343	330	199	60	0	0	4.1	
T11-29	I	R	4.5	368	345	230	67	0,0	0,0	3.8	1.073
	R		95	414	391	170	44	2	0	3.7	
T12-27	I	R	6.5	360	329	209	64	0,0	0,8	3.9	1.063
	R		96	300	282	104	37	0	0	4.0	
T20-5	I	R	4	397	358	231	64	0	0	3.2	1.062
	R		94	298	283	132	47	0	0	3.4	
T30-36	I	R	6	376	338	205	61	0	0	3.6	1.063
	R		63	372	331	111	34	0	0	3.7	
T30-47	I	R	6	356	334	261	78	0	0	2.9	
	R		48	360	350	221	63	0	0	3.6	
T30-71	I	R	5	324	301	188	63	0	0	3.8	1.061
	R		89	325	310	148	48	0	1	4.4	
T37-29	I	R	4	396	355	216	61	0,0	1,0	4.0	1.063
	R		41	348	318	111	35	0	1	4.0	

Clone	Loc.	GN	V.W. Scab	Cwt/A Total	Cwt/A >1-7/8	Cwt/A >2-1/2	% >2-1/2 >1-7/8	hht.	int. necr.	Score	SG
T53-26	I	R	4	405	382	300	79	0	0	3.4	1.079
	R		9	434	405	184	45	0	0	2.8	
T88-6	I	R	6	350	309	189	61	0	0	3.8	1.063
	R		20	322	302	119	40	0	0	3.9	
T272-32	I	R	6	337	314	220	70	0	0	2.9	1.067
	R		37	285	267	108	40	0	0	3.5	
T275-100	I	R	5	356	332	270	81	0	0	3.2	1.074
	R		72	253	219	88	40	0	0	3.6	

Loc : I = Ithaca, R = Riverhead
GN : R = resistant
Scab : Index of scab relative to Chippew
VW : 7 is susceptible
Score: Higher numbers are more attractive

Table 2. Ithaca 1980, Planted May 4
Vines killed August 28
Harvested September 11

	Cwt/A			defects (cwt)		% >2-1/2**					Specific
	Total	>1-7/8	>2-1/2*	wt.	type	of total	of >1-7/8	hht.	int. necr.	Score	gravity
Katahdin	347	329	247	0.3	gc & 2nd gr	71	75	0/120	4/120	6.4	1.073
Hudson	375	362	318	1.5	gc	85	88	0/60	0/60	6.7	1.075
NY59	362	344	284	1.8	gc	79	83	0/60	0/60	6.9	1.076
NY61	359	321	183			51	57	0/60	0/60	7.3	1.076
NY63	334	312	240	7.6	gc	74	78	0/00	4/60	8.0	1.069
NY66	341	329	290	2.1	gc	86	88	0/60	0/60	7.2	1.078
Q54-6	345	325	241			70	74	2/100	1/100	7.2	1.074
Q54-11	332	314	225	0.6	gc	68	72	0/60	2/60	6.1	1.069
Q155-3	284	260	146			52	56	0/60	1/60	6.5	1.063
R471-62	359	335	236	1.2	gc	66	70	0/100	12/100	7.3	1.068
Katahdin	334	313	228	Not recorded	Not recorded	68	73	1/30	0/30	3.0	
4Q74-12	278	263	198			71	75	0/30	0/30	3.3	1.061
S303-8	347	327	250			72	76	0/30	1/30	2.7	1.075
S374-4	262	238	93			35	39	0/30	0/30	3.0	1.059
S376-1	306	277	140			46	50	0/30	0/30	3.4	1.074
S376-2	355	318	185			52	58	0/30	0/30	4.1	1.065
S377-8	343	313	198			58	63	0/30	0/30	4.3	1.062
S377-41	376	344	208			55	60	0/30	0/30	4.1	1.072
S377-59	335	306	188			56	61	0/30	2/30	3.8	1.076

* defects not included in yield >2-1/2
** defects included

Table 3. Riverhead 1980, Planted April 23
Vines killed about September 15
Harvested September 30

	Cwt/A			defects (cwt)		>2-1/2**				Specific
	Total	>1-7/8	>2-1/2*	wt.	type	>1-7/8	hht.	int. necr.	Score	Gravity
Katahdin	400	377	215			57	0/120	15/120	6.7	1.065
Superior	312	293	112			38	2/50	1/50	5.8	1.063
Hudson	433	427	330	0.9	knobs	77	0/60	0/60	7.2	1.074
NY61	320	283	112			39	7/60	0/60	7.7	1.065
NY63	414	399	288	2.2	gc	72	2/120	7/120	8.9	1.065
NY66	300	287	197			68	0/60	1/60	7.9	1.065
Q54-6	329	314	204			65	0/60	10/60	7.6	1.068
Q54-11	307	291	120			41	2/60	0/60	5.6	1.066
R471-62	455	437	259	0.6	misshapen	59	0/60	7/60	7.2	1.064
Katahdin	334	305	127			42	1/60	2/60	3.3	
4Q74-12	247	238	122			51	0/30	2/30	3.8	1.062
S303-8	319	301	154	1.0	gc	51	0/30	4/30	3.2	1.068
S374-4	276	264	137			52	0/30	3/30	3.5	1.058
S376-1	234	216	79			36	0/30	0/30	3.2	1.072
S376-2	252	221	54			25	0/30	0/30	3.2	
S377-8	292	262	68			26	0/50	0/50	4.0	1.064
S377-41	319	291	111			38	0/30	1/30	3.4	1.063
S377-59	188	166	33			20	0/30	0/30	3.4	1.067

* defects not included in yield >2-1/2
** defects included

Table 4. Cato 1980, Planted May 16
Vines killed September 15
Harvested September 24

	Cwt/A Yield			defects >2-1/4		% >2-1/2**				
	Total	>1-7/8	>2-1/4*	wt.	type	of total	of >1-7/8	hht.	int. necr.	Score
Katahdin	308	300	249	0.4	gc	81	83	3/40	0/40	6.7
Norchip	261	223	163	25.6	gc&K	72	85	0/40	0/40	5.4
NY59	433	424	382	2.2	gc	89	91	0/40	2/40	7.1
NY61	411	374	265	6.3	gc	66	72	0/40	0/40	7.0
NY63	361	317	286	37.8	gc	90	1.00	0/40	0/40	7.5
NY66	368	353	316	13.0	gc	89	93	0/40	0/40	7.2
Q54-6	403	387	339	4.5	gc	85	89	0/40	0/40	7.5
Q54-11	367	355	294	13.0	K	84	86	0/40	1/40	6.4
Q155-3	362	346	276	0.9	gc	77	80	2/40	0/40	7.5
4Q74-12	277	262	229	10.4	gc	86	91	4/40	0/40	5.9
R471-62	434	390	301	19.8	gc&K	74	82	5/40	1/40	6.7
S303-8	365	324	250	18.0	gc	73	83	0/10	0/10	5.5
S374-4	264	237	167	16.7	gc&K	70	78	0/40	0/40	5.7
S376-1	244	227	172	1.4	gc&K	71	76	0/40	0/40	7.1
S376-2	344	324	250	4.0	gc&K	74	78	0/40	0/40	7.7
S377-8	364	343	261	0.9	K	72	76	0/40	0/40	8.2
S377-41	405	370	294	17.1	gc&K	77	84	0/40	0/40	7.1
S377-59	381	356	273	0		72	77	0/20	3/20	8.2

* defects not included in yield >2-1/4
** defects included

Table 5. Ithaca, 1980
Early harvest yield trial

	Total Yield	Wt./Tuber
Katahdin	188 cwt/A	.21 lb.
Hudson	173	.34
Superior	218	.21
NY59	174	.22
NY61	226	.16
NY63	178	.24
NY66	171	.29
Q54-6	172	.20
Q54-11	221	.23
Q155-3	195	.18
R471-62	204	.22

NORTH CAROLINA

F. L. Haynes

Breeding Program

The primary objectives continue to be early maturity, scab resistance, processing quality and adaptation to the Tidewater area. Chipping quality is essential since more than 80 percent of the crop is processed as chips. About 5 percent is processed as frozen french fries. The remainder is canned or marketed as fresh table stock.

Eastern Trials. Three locations in the early commercial area were planted to performance trials of selected clones. The results are presented in N.C. Tables 1, 2 and 3. The Tyrrell County location (N.C. Table 1) was the only site with a near-normal season. A heavy snowfall on March 3 delayed planting of this plot by two weeks. Otherwise the season was normal. The Weeksville location (N. C. Table 2) planting was delayed by the same snowstorm. In addition, this plot was severely damaged by a hailstorm in mid-May. The results represent in part a measure of the rate of recovery from hail damage. The low percentage of Size A tubers is a result of this damage. An unusually large number of small tubers were harvested for many clones. The Tidewater location (N.C. Table 3) suffered from both midseason drouth and excessively high temperatures in the three weeks preceeding harvest. The varieties Atlantic, Croatan and Pungo continued to be the best currently available. Atlantic suffered from internal browning (heat necrosis) at one location and Pungo produced heat sprouts at all locations. Croatan was free of both these problems.

Seedling Production and Clonal Maintenance. Clonal maintenance and increase from tuber-indexed seed tubers was conducted at Waynesville, in the mountains. The summer hybridization program was conducted at the same location.

Adaptation Study

The diploid breeding and adaptation project, previously described, was continued. The interbreeding population of hybrids of the highland tropic cultivated diploids S. phureja and S. stenotomum is adapted to the North Carolina latitude. As selection for adaptation has advanced, sub-projects have been initiated.

Heat Tolerance. Field evaluations for heat tolerance which were begun in 1977 have been continued. The evaluations are conducted at the Tidewater Research Station, Plymouth, and the Horticultural Crops Research Station, Castle Hayne. During July and August both these coastal locations experience temperatures equal to those of the lowland tropics. In 1979, seed were harvested from 153 clones which had survived at the two coastal locations. These seed resulted from random mating among the 153 clones. In April, 1980 25 seedlings per parent were planted at each location. An identical size planting from remnant (unselected) seed from each family was also planted at each location. These were harvested in mid-August and data recorded for survival, tuberization and yield. Considering the two generations as a whole, survival increased by

3 percent, tuberization increased by 15 percent, and mean yield per plant increased 38 percent. In addition, the variance for yield in the selected generation was larger than the variance for yield in the unselected generation. This sub-population will be subjected to another cycle of selection.

High Dry Matter. The clones previously selected for high specific gravity were again evaluated in 1980. Their superiority in specific gravity was confirmed. In addition, new families were screened for additional sources of high dry matter. Fifteen new clones were selected.

The study of high dry matter stability under high temperatures was continued. In 1980, the 27 stable clones, previously reported, plus seven additional selections were tested in the same locations. Because of extremely high temperatures, a few clones did not survive. Across all locations and years, the only variance consistently significant was that of clones. The clones surviving both years are being selectively intercrossed and out-crossed to tetraploids for further study.

4X - 2X Crosses. A program of hybridization has been initiated among selected commercial tetraploids and diploids from the high dry matter selections. The diploids were chosen for pollen parents by screening for those producing unreduced gametes. A total of 30 crosses produced seeds. The results from six crosses are presented in N.C. Table 4.

The progenies were grown in the greenhouse at Raleigh during the summer of 1980. Plants were grown in 6-inch pots and specific gravity determined from the total tuber production. In most cases 60 to 100 grams of tubers were produced. Average specific gravity for progenies did not equal the mean of the parents, nor, in most cases, did the highest segregate in each cross equal the highest parent. There were two exceptions. Progress was made in increasing dry matter, however, since the highest tetraploid segregates in most crosses exceeded the mean of the parents. A few crosses produced segregates with lower average specific gravity than the parents, indicating wide differences in combining ability for specific gravity.

The hybridization program will be greatly expanded. Crosses between selected tetraploids and selected diploids from the various sub-populations will be attempted.

North Carolina Table 1. Potato performance trial in Tyrrell County. Plots were 1 row, 27 ft. long, 4 replications of 40 entries in RCB, 36 hills/plot. Spacing in row, 9 inches. Width row, 40 inches. Fertilized: 1200 lbs./A. 10-20-20 banded. Total/A. 120 lbs. N., 240 lbs. P_2O_5, 240 lbs., K_2O. Planted 3/20/80, harvested 6/25/80 (97 days).

Variety	US#1-A cwt/A	Percent US#1-A	Specific Gravity	Chip[1/] Color	Appear[2/] ance	Maturity
B8433-4	352	94.4	1.063	3.5	7.5	Med. early
73C26-5	350	94.3	56	3.8	7.2	Midseason
Atlantic	347	91.2	80	2.5	7.7	Midseason
B9455-N9	338	91.4	73	2.8	7.0	Med. early
Croatan	333	87.8	64	2.5	7.5	Midseason
73C26-4	331	93.8	67	3.0	8.0	Midseason
B9336-N3	323	85.5	79	2.5	7.7	Midseason
Belchip	319	91.5	71	1.8	7.0	Midseason
Pungo	307	86.5	68	2.0	7.5	Midseason
B9336-N11	305	89.0	70	2.3	7.7	Early
B9476-N2	305	89.1	71	5.0	7.2	Midseason
Superior	301	91.0	72	2.3	8.5	Early
72C75-3	295	80.2	66	3.5	7.0	Midseason
71C15-20	292	90.7	80	1.5	8.0	Midseason
B8686-8	289	87.3	80	2.3	6.7	Midseason
B7151-4	288	93.3	80	2.5	6.2	Midseason
71C4-5	286	91.9	82	1.8	8.0	Midseason
73C25-2	285	68.1	57	5.5	7.2	Midseason
73C26-1	280	84.6	70	2.8	8.0	Med. early
Norchip	280	85.4	76	2.0	7.7	Med. early
72C75-2	278	79.7	64	3.3	7.7	Midseason
B8477-4	273	89.3	68	2.3	7.0	Midseason
76C10-3	251	85.8	62	2.3	7.5	Midseason
B8977-2	247	72.5	63	2.0	6.7	Midseason
B9455-N4	246	85.1	79	2.5	8.0	Early
B8599-2	245	78.1	62	1.5	8.0	Med. early
B9484-N1	243	87.3	64	1.8	7.0	Midseason
76C11-3	232	81.4	69	3.8	8.0	Med. early
B8615-2	232	87.1	69	2.8	7.0	Midseason
73C28-1	231	80.0	64	2.8	7.7	Early
B8934-4	224	71.6	70	2.3	8.0	Early
B8972-1	220	75.6	66	2.0	8.7	Early
B9384-N1	200	73.4	64	1.8	7.0	Midseason
B8943-4	195	69.5	73	2.8	7.2	Early

North Carolina Table 1 continued.

B8848-2	194	59.5	71	3.3	6.7	Midseason
B9384-N2	186	73.7	69	2.8	7.5	Early
76C23-1	185	62.7	67	2.8	7.2	Midseason
B8966-3	176	61.5	61	2.8	7.2	Early
B8218-4	151	62.0	67	3.3	8.0	Early
B7583-6	134	47.2	71	4.5	6.5	Med. early
L.S.D. (.05)	47					
C.V. (PCT)	12.7					

1/ Chip color determined by Wise Foods, Borden, Inc., Berwick, Pa. Average of 5 samples, 1 per week for 5 weeks following harvest. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

2/ Appearance
1 = Very poor
3 = Poor
5 = Fair
7 = Good
9 = Excellent

North Carolina Table 2. Potato performance trial at Weeksville. Plots were 1 row, 27 ft. long, 4 replications of 24 entries in RCB, 36 hills/plot. Spacing in row, 9 inches. Width row, 40 inches. Fertilized: 1800 lb./A. 10-10-10. Planted 3/26/80, harvested 6/26/80 (91 days).

Variety	US#1-A cwt/A	Percent US#1-A	Specific Gravity	Chip[1/] Color	Appear[2/] ance	Maturity
Croatan	215	85.2	1.060	2.8	7.0	Midseason
Atlantic	206	89.4	79	3.3	7.2	Midseason
Pungo	203	88.6	67	2.5	7.2	Midseason
Belchip	199	86.9	63	2.0	7.0	Midseason
75C2-5	198	89.7	59	4.8	7.7	Med. early
75C5-4	193	89.3	57	4.8	8.0	Med. early
71C15-20	192	89.1	81	2.0	8.0	Midseason
73C26-4	192	92.9	58	3.8	7.2	Midseason
72C75-3	187	81.9	67	4.3	7.2	Midseason
72C75-2	185	82.7	60	3.3	7.7	Med. early
B9336-N10	172	85.2	61	3.8	8.0	Med. early
73C25-2	171	87.0	49	6.5	7.5	Med. early
71C4-5	170	87.8	75	2.5	8.2	Midseason
Norchip	163	76.7	70	2.0	7.0	Med. early
73C26-1	160	84.7	64	3.0	8.0	Early
73C26-5	150	88.1	49	5.5	7.0	Midseason
73C1-3	143	75.3	70	4.0	7.0	Midseason
76C4-5	142	82.8	70	3.3	7.2	Midseason
Superior	134	80.5	65	3.3	8.0	Med. early
73C1-4	125	65.0	62	3.5	7.5	Midseason
B8686-8	114	69.2	77	3.8	7.0	Midseason
B7583-6	113	84.9	67	5.8	7.0	Midseason
B8218-4	96	69.3	70	3.3	7.5	Midseason
B9004-N2	82	73.5	-	-	6.0	Midseason
L.S.D. (.05)	37					
C.V. (PCT)	16.2					

1/ and 2/ See footnotes, N.C. Table 1.

North Carolina Table 3. Potato performance trial at Tidewater Research Station, Plymouth. Breeding clone trial. Plots were 1 row, 30 ft. long, 30 replicated entries, 28 augmented entries (7 per rep), 4 replications in RCB W/aug. ent. design. 36 hills per plot. Spacing in row, 10 inches. Width row, 38 inches. Fertilized: Total/A. 100 lbs. N, 200 lbs. P_2O_5, 200 lbs. K_2O banded. 30 lbs./A. N. applied midseason. Planted 3/27/80, harvested 6/27/80 (91 days).

Variety	Total cwt/A	Percent US#1-A	Appear-ance [2/]	Maturity
		Replicated entries		
Pungo	280	76.9	7.0	Midseason
Croatan	279	84.9	7.5	Med. early
75C5-4	273	85.5	7.0	Med. early
72C75-3	259	73.3	7.5	Med. early
Belchip	258	83.6	7.0	Midseason
B8706-N2	253	66.5	7.2	Med. early
73C26-4	249	90.1	7.8	Midseason
Oceana	249	74.6	8.8	Early
Atlantic	248	86.8	7.0	Midseason
73C28-4	247	73.2	6.7	Midseason
73C26-5	246	78.7	6.5	Midseason
71C15-20	246	73.6	7.8	Midseason
72C75-2	241	68.0	7.0	Midseason
Superior	240	76.2	7.5	Early
B9455-N16	233	80.7	7.5	Midseason
B9336-N11	230	80.1	7.8	Early
73C1-3	229	66.4	7.0	Midseason
B9004-N3	227	82.4	8.0	Med. early
Superior-L	224	81.0	7.0	Midseason
73C1-4	218	69.0	8.0	Early
71C4-5	215	69.4	7.0	Med. early
B8755-N7	213	74.6	9.0	Early
B7151-4	212	84.8	7.0	Med. early
B9336-N2	211	79.3	7.7	Early
Norchip	211	70.1	7.0	Early
B9384-N1	191	77.9	7.0	Med. early
B8644-N1	173	66.2	6.7	Early
B8686-8	165	64.9	7.0	Med. early
B7583-6	152	73.6	7.0	Med. early
B9476-N1	149	70.6	6.2	Med. early

North Carolina Table 3 continued.

	Augmented entries - Rep I - adjusted yields			
B9455-N9	284	77.3	7.0	Early
B9455-N5	244	74.1	9.0	Early
76C2-2	235	83.4	7.0	Midseason
75C2-5	230	79.2	7.0	Early
75C2-1	202	79.1	7.0	Med. early
Sebago	161	77.8	7.0	Late
B9004-N2	123	82.5	7.0	Med. early
	Augmented entries - Rep II - adjusted yields			
73C25-2	286	74.7	8.0	Early
76C4-5	228	86.0	7.0	Midseason
B9455-N7	221	59.0	7.0	Med. early
76C4-2	213	82.3	8.0	Med. early
B9476-N2	179	69.5	7.0	Early
B8218-4	174	74.8	8.0	Med. early
Belrus	119	74.8	8.0	Early
	Augmented entries - Rep III -adjusted yields			
76C1-1	249	78.9	7.0	Midseason
73C28-1	234	79.3	9.0	Early
B9455-N4	224	77.2	8.0	Early
B8579-N1	204	74.4	8.0	Midseason
B9384-N11	199	60.7	7.0	Early
B8443-N1	194	80.3	7.0	Midseason
B8741-N4	182	58.7	7.0	Early
	Augmented entries - Rep IV - adjusted yields			
B9336-N3	253	86.0	8.0	Midseason
73C26-1	235	81.7	8.0	Early
B9336-N10	231	81.2	8.0	Midseason
Norland	209	81.9	8.0	Early
B9384-N9	182	69.5	7.0	Early
B9452-N5	138	79.8	8.0	Early
B9384-N2	93	77.1	6.0	Early

L.S.D. (.05) RE	34
L.S.D. (.05) AE Same R.	67
L.S.D. (.05) AE Dif. R.	68
L.S.D. (.05) AE vs RE	54
C.V. (PCT)	10.5

2/ See footnote, N.C. Table 1.

North Carolina Table 4. Behavior of high dry matter diploids in 4X - 2X crosses.

Parentage	Tetraploid Progeny			
4X x 2X	No.	Highest S.G.	Average S.G.	Lowest S.G.
1.078 x 1.116	6	1.094	1.081	1.065
1.080 x 1.099	24	1.099	1.082	1.050
1.080 x 1.109	17	1.098	1.083	1.074
1.080 x 1.142	9	1.106	1.085	1.054
1.080 x 1.116	20	1.101	1.087	1.060
1.072 x 1.099	64	1.143	1.072	1.038

NORTH DAKOTA

R. H. Johansen, B. Farnsworth, D. Hahn, G. Secor and P. Nolte

Potato Breeding Program

Crossing and Seedling Production. A total of 333 crosses were made in the greenhouse during the winter and early spring of 1980. Breeding emphasis involved parents with high yield, russeting, good red skin color, processing qualities, high solids, good horticultural characteristics and disease resistance. Crosses adapted for California potato production were also made, as North Dakota has cooperated with the University of California-Davis for the past six years and is involved with the California potato breeding and varietal development program. Approximately 50,193 seedlings were grown in the greenhouse during the summer of 1980 and these seedlings will be planted in the field at the Langdon Agricultural Experiment Station in 1981.

At the Langdon Agricultural Experiment Station, 51,618 seedlings were growth in the field during 1980 and approximately 1,141 seedlings were saved for further testing and evaluation. The seedling plot at Langdon was planted on May 12th and 13th and harvested on September 15th,16th and 17th.

Advanced Selections. Eight hundred and thirty-four second year, 189 third year and 116 fourth year and older selections were grown in five and 10 hill plots at Grand Forks and Casselton. Two hundred and fifty-eight selections and cultivars from other states were grown in similar plots at Grand Forks. An elite seed increase by the Department of Plant Pathology of second year and older selections was made at Absaraka and Casselton. In addition, a seed increase by the Department of Horticulture of older selections was also made at Casselton. Several second year and advanced selections were also grown for seed increase at Beach, North Dakota. At Grand Forks two replications of all second year selections were planted in separate blocks and tested for disease and general adaptability. The plots at Grand Forks were planted on May 13th and harvested on September 2nd, 3rd and 25th. The plots at Casselton were planted on May 8th and 15th and harvested September 11th, 24th, and 26th.

Promising Selections. Line ND8891-3 was named Crystal in 1980. This cultivar has excellent yield and chips quite comparable to Kennebec. It is oblong oval in shape and should be quite well adapted for the french fry trade.

The Idaho selection, A68678-1 was named Lemhi in 1980 and North Dakota was one of the states cooperating in introducing this cultivar. Lemhi has good shape and type, good yield and total solids and compared to Norgold Russet, is less susceptible to hollow heart. Lemhi should be a good russet cultivar to grow for seed, table or processing in the Red River Valley.

Advanced selections showing promise are ND146-4R, TND 14-1Russ, ND463-1R, ND258-1, ND55-7, ND119-3, ND206-1R, and ND294-1R. Of these, ND146-4R and TND 14-1Russ have the largest increase of foundation seed and probably

will be the first selections to be named. Most of the others have some seed increase at Beach and the Red River Valley. Seed for North Dakota selections are increased by growers at Beach, Voss, Walhalla, and Cando, North Dakota and at Barnesville, Minnesota.

Cultivar Trials. In 1980, replicated trials were planted in the Red River Valley at Park River and Grand Forks and in western North Dakota at Minot and Williston. Wayne Grinde, County Extension Agent, was in charge of the Park River trial while Dennis Askim, Farm Manager of the Potato Research Farm, was in charge of the Grand Forks trial. Superintendents Ernie French and Ben Hoag were in charge of the Williston and Minot trials, respectively.

Twenty-five hills were planted in four replicated blocks. Twenty-five entries were grown in plots at Park River and Grand Forks, while 16 were grown at Minot and Williston. Marketable yield consisted of all U.S. No. 1 tubers over 1 7/8 inches in diameter. Specific gravity was determined by the use of the potato hydrometer. Spacing, fertilizer, soil type, planting date and harvest date are found in North Dakota Table 1.

North Dakota Table 1. Spacing, fertilizer, soil type, planting and harvest dates of the 1980 trial.

	Spacing				Plant-	Har-
	Row	Plant			ing	vest
Location	(in.)	(in.)	Fertilizer	Soil Type	Date	Date
Grand Forks	38	12	22-22-12 200#/A	Bearden Clay Loam	5/12	9/22
Park River	38	12	Fall Broadcast	Glyndon Silt Loam	4/29	9/4
Minot	38	14	105-70-0#/A	Williams Loam	5/7	9/25
Williston	36	16	None	Williams Sandy Loam	5/19	9/29

The growing season for 1980 was very unusual and erratic. The spring was early and very dry. Little or no rain fell in the eastern or western part of North Dakota until late May or mid-June. The plot at Park River was planted on the 29th of April, which was one of the earliest plantings ever made. At Grand Forks, 1.09 inches of rain fell in June, 1.55 inches in July and 4.63 inches in August. In general, most of the precipitation occurred in August and early September in both eastern and western North Dakota. Minot had 4.37 inches of precipitation in August and 2.66 inches in September.

Temperatures were near normal for most of the season and this resulted in fair yields in spite of the early drought. The dry spring and early summer greatly reduced the yields at several locations. The average yield at Grand Forks for the entries in trial was 146 cwt per acre of U.S. No. 1 yield compared to Park River with an average of 239 cwt per acre of U.S. No. 1 yield. The variety trial at Minot and Williston with 16 entries averaged 199 and 159 cwt per acre U.S. No. 1 yield, respectively.

In the eastern or Red River Valley trials at Park River and Grand Forks, Crystal, with an average of 275 cwt per acre was the highest yielding entry. This cultivar was followed in yield by Red Pontiac and Kennebec with 270 and 254 cwt per acre, respectively. Dakchip, ND258-1 and Lemhi were also high yielding entries. Line ND55-7 was comparable to Norchip in yield and looked quite good in the trial. The red selection, ND146-4R, averaged 189 cwt per acre compared to Red Norland with 212 cwt per acre. Line AND 7422-1Russ for the second year was the lowest yielding entry in trial and most likely will be dropped from any further yield testing.

In the western trials at Minot and Williston, Lemhi was the highest yeilding entry followed by Kennebec and Red Pontiac. Crystal was not one of the higher yielding entries in the western trials.

Lines ND383-9, ND55-7, Norchip and ND372-2R produced the highest specific gravity or percent total solids. Lemhi, AND7422-1Russ, ND8850-2, ND258-1, ND193-2, TND 14-1Russ, Dakchip and Crystal all produced solids ranging 20 percent or above. Data for the cultivar trials are found in North Dakota Tables 2 and 3.

Processing Tests. From the 1980 test plots, 134 second year, 91 third year and older and approximately 80 cultivars and selections and material from other states will be tested for chip quality by the Potato Research Lab at East Grand Forks, Minnesota. The second year selections (134) were analyzed for sucrose.

From the 1979 plots, 210 second year selections were tested for chip quality during the winter and spring of 1980. Seventeen of these had an Agtron reading of 40 and above. The second year selections were chipped only once after being stored at 65° F for approximately three months. In a similar test, the third year and older selections (approximately 116) were chipped out of storage at 43° F and 65° F after approximately three to four months storage.

Chip tests were also conducted on all entries grown in the Park River and Grand Forks variety trials during 1979. Lines ND55-7, ND119-3, ND258-1, ND9476-5, and ND194-7 all seemed to have chipping potential. In most cases they were as light in color as Norchip and in some cases, lighter. Crystal seems to be quite similar to Kennebec in chip quality. Chip quality results from entries grown in the 1979 trials are found in North Dakota Tables 4 and 5.

Frozen French Fry and Flake Tests. Frozen french fries and flakes were prepared from several promising advanced selections by the Potato Research Lab at East Grand Forks, Minnesota. Sensory evaluation tests were made by the Food and Nutrition Department of the College of Home Economics on the frozen french fry and flake samples. The sensory scores for ND 119-3 and Crystal exceeded that of both Russet Burbank and Kennebec. Lemhi was slightly below Russet Burbank but higher than Kennebec in its sensory score. Results of the sensory scores are found in North Dakota Table 6.

Culinary Tests. Boiling and baking tests were also done on all entries and material from the 1979 trials grown at Park River and Grand Forks. Some sloughing was observed in selections ND194-7, ND258-1, AND 7422-1Russ, ND372-2R, and ND55-7. This can be expected as all of these selections

are high in total solids. Crystal was shown to be both an excellent boiling and baking potato. Some after-cooking darkening was observed in Dakchip, ND146-4R, ND372-2R, ND194-7 and Red Pontiac. Results are found in North Dakota Tables 7 and 8.

Other Trials. A cultivar trial consisting of only russet skin selections and cultivars was included with the North Central Regional Potato Trial at Grand Forks. A report on russet entries are found in North Dakota Table 9. Lines ND534-4Russ and ND388-1Russ looked the most promising in the russet trial. A summary of the North Central Regional Trial will be found in the 1980 North Central Regional Trial Report.

In addition, a performance trial of potato cultivars with potential for ethanol production was planted at Grand Forks in cooperation with the USDA at Prosser, Washington. Six other states cooperated with this project and North Dakota data from this trial is found in North Dakota Table 10.

Disease Resistance and Control. Approximately 1,000 selections were evaluated for scab and silver scurf resistance at the Potato Research Farm, Grand Forks. Many selections appeared to have excellent resistance to scab and silver scurf. Over 50% of the selections showed some resistance to both of these diseases.

Approximately 800 second year selections were grown in a potato free area (Absaraka) and evaluated for disease and horticultural characters. Diseased selections were removed and superior selections saved for further observation and indexing.

Approximately 400 advanced selections were indexed for spindle tuber using gel electrophoresis and PVX using serology. None were found to be infected with PSTV. The disease-free selections were maintained at the Agronomy Seed Farm, Casselton, as a source of clean seed for breeding and other purposes.

Approximately 30 selections were indexed and released to growers in Beach, North Dakota for increase as part of the basic seed stock program.

Representative tubers of second year and advanced selections were grown in Florida for winter indexing of virus diseases (cooperator, Doug Johansen, State Seed Department).

North Dakota Table 2. U.S. No. 1 Yield, Percent U.S. No. 1 and Total Solids of Potato Cultivars and Selections Grown in the Red River Valley Trials - 1980.

	Grand Forks			Park River			Average		
Cultivar	Cwt/A U.S.No.1 Yield	% U.S. No.1	% Total Solids	Cwt/A U.S.No.1 Yield	% U.S. No.1	% Total Solids	Cwt/A U.S.No.1 Yield	% U.S. No.1	% Total Solids
Crystal	196	95	20.1	354	96	20.5	275	96	20.3
Red Pontiac	219	97	18.2	322	100	17.9	270	99	18.1
Kennebec	156	94	19.0	352	97	18.0	254	95	18.5
Dakchip	198	96	19.7	260	97	20.3	229	97	20.0
ND258-1	167	93	20.3	274	94	20.1	220	94	20.2
Lemhi	148	90	20.3	288	95	21.6	218	93	21.0
ND463-1R	163	94	19.4	271	100	19.9	217	97	19.7
ND294-1R	168	87	20.1	262	87	19.4	215	87	19.8
Red Norland	162	96	19.2	262	96	19.0	212	96	19.1
ND55-7	174	82	20.5	249	88	21.8	211	85	21.2
Norchip	171	91	21.4	247	90	21.6	209	91	21.5
Norgold Russet	197	92	19.0	218	92	20.3	207	92	19.7
Viking	163	90	18.8	245	98	19.9	204	94	19.4
ND372-2R	125	77	21.4	277	89	20.7	201	83	21.2
Bison	176	97	18.6	204	96	19.7	190	97	19.2
Russet Burbank	112	84	19.7	253	85	19.7	182	85	19.7
ND146-4R	152	94	19.9	227	93	19.9	189	94	19.9
ND467-3	160	91	19.2	209	86	19.4	184	89	19.3
ND119-3	124	94	19.2	206	94	18.8	165	94	19.0
ND206-1R	80	77	18.4	239	94	19.2	159	86	18.8
TND14-1Russ	113	88	20.5	188	93	20.7	150	91	20.6
ND8850-2	131	82	20.3	149	72	19.9	140	77	20.1
ND193-2	89	84	19.7	177	89	20.5	133	87	20.1
ND383-9	83	82	23.1	126	75	21.6	104	79	22.4
AND7422-1Russ	76	57	20.5	111	58	21.2	93	58	20.9
Average	148	89	19.9	238	90	20.0	193	89	19.9

North Dakota Table 3. U.S. No. 1 Yield, Percent U.S. No. 1 and Total Solids of Potato Cultivars and Selections Grown in Western North Dakota Trials, 1980.

	Minot			Williston			Average		
Cultivar	Cwt/A U.S.No.1 Yield	% U.S. No.1	% % Total Solids	Cwt/A U.S.No.1 Yield	% U.S. No.1	% % Total Solids	Cwt/A U.S.No.1 Yield	% U.S. No.1	% % Total Solids
Lemhi	257	97	21.6	229	95	21.6	243	96	21.6
Kennebec	252	96	19.4	219	96	20.4	236	96	19.9
Red Pontiac	260	96	18.2	212	96	20.7	236	96	19.5
Dakchip	250	93	20.1	183	94	21.8	217	94	21.0
Russet Burbank	209	90	19.9	180	90	20.3	195	90	20.1
Norchip	222	91	20.9	161	88	21.8	192	90	21.4
ND372-2R	219	96	21.2	159	95	22.2	189	96	21.7
Viking	209	98	19.9	142	99	21.4	176	99	20.7
Norgold Russet	182	94	19.7	162	93	22.0	172	94	20.9
ND55-7	191	92	22.4	142	88	22.0	167	90	22.2
Bison	172	87	20.5	149	92	21.4	161	88	20.9
Red Norland	183	97	18.8	131	94	20.3	157	96	19.6
Crystal	175	95	22.2	126	93	22.2	151	94	22.2
ND146-4R	150	92	20.3	121	95	21.6	136	94	21.0
ND119-3	128	95	19.0	121	96	20.7	125	96	19.9
TND 14-1Russ	131	96	20.9	109	96	22.4	120	96	21.7
Average	199	94	21.7	159	94	21.4	180	94	21.9

North Dakota Table 4. 1980 Chip Tests of Cultivars and Selections Grown at Grand Forks, North Dakota - 1979

Cultivar	0 weeks - 38° F			2 weeks - 68° F			4 weeks - 68° F		
	Color Chart 1/	Photo-volt 2/	Yield 3/	Color Chart	Photo-volt	Yield	Color Chart	Photo-volt	Yield
Bison	9.0	15.5	31.3	8.5	19.5	29.5	7.5	25.6	29.5
Crystal	8.5	16.8	32.0	8.5	13.1	31.0	9.5	11.9	30.3
Dakchip	9.5	11.4	33.0	9.5	15.0	34.0	9.0	12.3	32.0
Kennebec	8.5	12.5	31.3	10.0	9.9	31.0	9.0	14.0	30.0
Lemhi	10.0	10.3	33.5	10.0	11.9	33.3	9.0	14.9	32.5
Norchip	7.5	22.8	35.0	7.5	28.5	33.5	7.0	31.3	33.8
Norgold Russet	11.0	8.5	32.0	10.0	9.5	31.3	10.0	9.0	31.8
Norland	11.0	8.9	29.8	10.0	11.8	29.5	9.0	13.6	30.5
Red Pontiac	11.0	7.4	29.8	10.5	8.0	30.5	10.0	13.1	30.3
Russet Burbank	10.0	11.8	32.8	10.0	10.4	31.5	10.0	10.0	34.0
Viking	11.0	6.8	29.5	11.0	7.3	29.5	11.0	6.5	28.0
AND 7422-1Russ	11.0	8.6	35.0	9.5	15.4	33.5	9.0	15.3	35.3
ND55-7	8.5	17.5	29.5	9.0	16.3	31.5	7.5	26.0	31.8
ND119-3	8.0	19.6	31.5	6.5	35.5	32.3	7.0	27.6	31.3
ND137-2Russ	10.0	10.6	32.0	10.0	10.5	31.5	9.5	13.5	32.0
ND146-4R	9.0	16.6	32.3	8.0	21.6	32.0	6.8	28.0	30.5
ND194-7	8.0	19.6	32.3	8.0	18.9	36.0	7.0	25.9	33.0
ND206-1R	10.5	9.4	31.0	9.5	13.5	31.0	9.5	11.9	28.5
ND248-3Russ	10.5	9.0	31.0	9.0	15.1	31.8	9.5	13.5	31.0
ND258-1	8.5	15.3	33.8	9.0	20.6	31.5	7.5	21.5	32.3
ND294-1R	11.0	8.5	30.3	9.5	13.3	30.0	8.0	17.5	30.0
ND329-4Russ	10.0	10.9	31.0	10.0	10.5	30.8	8.5	17.4	30.0
ND372-2R	10.0	13.3	34.5	9.5	14.8	33.8	8.5	19.0	33.5
ND8850-2	8.5	20.3	32.5	7.5	22.9	32.8	8.5	18.9	32.5
ND9476-5	9.0	17.5	31.3	7.0	24.0	33.0	6.5	25.0	31.8
Average	9.6	13.1	31.9	9.1	15.5	31.8	8.6	17.8	31.4

1/ Color Chart (1 light, 11 dark)
2/ Photovolt - Higher numbers are lighter in color
3/ Yield - Percent chip yield

North Dakota Table 5. 1980 Chip Tests of Cultivars and Selections Grown at Park River, North Dakota - 1979

Cultivar	0 weeks - 38° F			2 weeks - 68° F			4 weeks - 68° F		
	Color Chart[1]	Photo-volt[2]	Yield[3]	Color Chart	Photo-volt	Yield	Color Chart	Photo-volt	Yield
Bison	8.5	19.4	32.0	6.5	32.3	32.0	4.3	37.4	32.3
Crystal	8.5	17.4	35.0	8.0	24.8	33.0	6.0	30.6	36.0
Dakchip	8.0	20.5	35.5	6.8	31.0	37.0	6.3	33.5	37.5
Kennebec	8.0	18.3	35.8	6.8	33.4	35.0	6.0	39.5	34.8
Lemhi	8.0	19.0	33.5	7.5	26.1	36.0	6.5	28.5	33.3
Norchip	8.5	21.0	34.8	6.3	38.8	34.8	3.8	41.8	36.5
Norgold Russet	10.5	10.9	33.3	9.5	18.5	33.0	9.0	19.3	34.0
Norland	9.5	12.5	32.3	9.5	17.8	31.3	6.8	30.8	31.5
Red Pontiac	10.5	9.3	32.3	9.5	13.9	31.0	7.3	26.8	32.8
Russet Burbank	9.5	13.8	36.8	9.0	19.9	35.3	7.5	26.9	35.3
Viking	11.0	8.1	33.3	10.0	11.9	30.8	8.5	19.6	33.3
AND 7422-1Russ	9.0	12.5	38.5	8.0	22.9	36.3	5.3	32.5	39.0
ND55-7	8.0	23.3	35.3	5.3	36.4	36.0	4.5	37.3	36.0
ND119-3	6.5	25.3	33.8	5.8	36.3	34.0	5.3	36.8	34.0
ND137-2Russ	10.0	10.6	33.0	8.0	22.8	34.0	7.8	26.6	33.8
ND146-4R	9.5	14.5	32.3	7.5	24.3	32.8	6.3	34.3	33.3
ND194-7	6.0	32.4	36.8	5.3	40.6	36.8	4.3	42.0	35.8
ND206-1R	9.0	16.0	32.8	8.0	24.5	33.8	6.5	29.9	32.8
ND248-3Russ	7.5	19.4	35.3	7.0	30.5	33.8	6.0	30.5	34.8
ND258-1	7.0	23.6	35.5	5.3	37.6	35.0	4.3	37.9	34.3
ND294-1R	11.0	7.9	32.0	9.5	16.8	32.8	6.5	28.9	33.5
ND329-4Russ	9.5	12.0	33.0	7.3	27.6	33.0	5.8	32.0	34.3
ND372-2R	10.0	14.0	35.0	8.5	20.4	36.0	7.0	28.1	35.5
ND8850-2	6.5	32.4	35.5	7.3	34.9	33.3	5.8	32.9	34.3
ND9476-5	7.5	28.0	33.0	5.5	38.3	33.8	4.2	39.4	31.5
Average	8.7	17.7	34.2	7.5	27.2	34.0	6.4	32.1	34.4

1/ Color Chart (1 light, 11 dark)
2/ Photovolt - Higher numbers are lighter in color
3/ Yield - Percent chip yield

North Dakota Table 6. French Fry and Flake Tests of Potato Cultivars and Selections Grown in 1979 Trials[1/].

Cultivar	Color[2/]	Texture	Flavor	Average
		FRENCH FRIES		
ND119-3	7.5	6.3	6.6	6.80
ND612-9	7.05	6.4	6.55	6.66
ND413-4	7.0	5.9	6.2	6.36
TND 14-1Russ	6.1	6.2	6.3	6.20
ND312-3	6.35	6.15	6.0	6.16
ND193-2	6.35	5.75	6.0	6.03
ND412-2	6.35	5.6	5.55	5.83
ND9750-3	6.4	5.2	5.65	5.75
Crystal	5.9	5.25	5.9	5.68
AND7422-1Russ	5.25	6.45	5.3	5.67
ND445-1	6.05	5.2	5.05	5.43
ND383-9	5.3	4.25	5.2	4.92
Russet Burbank	5.05	4.6	4.75	4.80
Lemhi	4.3	4.95	4.65	4.63
ND217-4Russ	4.45	4.45	4.8	4.57
ND467-9	4.65	3.75	4.85	4.42
ND450-11Russ	4.55	4.0	4.35	4.30
Kennebec	4.0	4.35	4.45	4.27
ND617-2	4.15	4.1	3.85	4.00
ND549-5Russ	3.65	3.65	3.65	3.65
ND534-4Russ	3.75	3.95	2.9	3.53
Average	5.41	5.02	5.13	5.18
		POTATO FLAKES		
TND 14-1Russ	8.25	7.25	7.75	7.75
ND119-3	8.0	7.0	7.0	7.33
ND193-2	8.0	7.0	6.75	7.25
ND312-3	8.25	6.0	7.5	7.25
ND413-4	7.5	7.25	7.0	7.25
ND9476-5	8.0	7.0	6.75	7.25
ND329-4Russ	7.8	6.4	7.4	7.20
Dakchip	7.75	7.0	6.5	7.08
Lemhi	8.0	6.2	7.0	7.06
ND8850-2	7.4	7.6	6.0	7.00
Crystal	7.25	7.25	6.5	7.00
ND412-2	7.25	7.0	6.5	6.92
ND55-7	7.25	6.75	6.75	6.92
ND292-1	7.75	7.0	5.5	6.75
ND258-1	8.2	5.4	6.4	6.67
TND 22-2	7.0	6.75	5.75	6.50
AND 7422-1Russ	7.0	5.75	6.75	6.50
AND 74569-1Russ	5.5	4.5	6.5	5.50
Average	7.56	6.68	6.68	6.95

1/ RATING GUIDE: 7-9 (Good); 5-6 (Fair, but acceptable); 1-4 (Poor, not acceptable)

2/ Not treated for color correction on french fry score.

North Dakota Table 7. 1980 Cooking Tests of Cultivars and Selections Grown at Grand Forks, North Dakota-1979.

	Boiling					Baking		
Cultivar	Sloughing[1]	Mealiness[2]	Color After Cooking[3]	Color 4 Hours After Cooking[4]	Flavor[5]	Mealiness	Color	Flavor
Crystal	8.7	8.7	9.0	9.5	9.3	8.7	8.0	7.7
ND119-3	8.7	8.7	9.3	7.0	9.0	8.0	10.0	8.7
Red Pontiac	10.0	9.0	10.0	5.0	10.0	6.0	10.0	9.0
ND137-2Russ	8.8	9.3	8.3	7.5	8.3	8.2	9.7	7.6
Norland	9.7	6.7	9.3	8.0	8.0	7.3	9.7	8.7
Lemhi	8.7	9.0	8.7	8.5	8.0	8.0	8.7	7.6
ND8850-2	8.0	9.0	8.0	8.0	9.0	8.3	7.7	8.7
Dakchip	8.5	7.8	9.5	8.0	6.8	7.7	9.7	7.7
ND55-7	5.7	7.4	8.7	8.5	8.3	8.7	9.0	8.7
ND258-1	7.7	8.3	8.0	8.0	8.0	7.7	9.0	8.3
Kennebec	8.0	8.7	7.3	8.0	8.3	8.7	8.3	7.6
AND 7422-1Russ	7.8	8.1	7.7	9.5	8.0	7.7	8.3	7.8
ND372-2R	6.3	9.3	9.3	7.5	8.3	6.3	9.7	8.0
ND9476-5	7.5	7.2	9.0	9.0	7.4	7.8	8.7	8.0
Norgold Russet	8.6	7.7	9.0	6.0	8.0	7.5	9.0	8.2
Viking	10.0	7.3	7.7	6.0	8.3	7.3	9.7	7.3
Russet Burbank	8.4	6.2	8.0	9.5	7.3	7.3	8.7	7.6
ND329-4Russ	8.4	6.8	7.5	8.0	7.4	7.5	8.7	8.4
ND146-4R	9.3	7.3	7.7	5.5	8.3	7.7	8.3	8.0
ND194-7	4.1	9.0	8.5	6.5	8.2	7.7	9.3	8.2
ND294-1R	8.4	6.7	9.0	7.5	6.6	7.2	9.3	6.8
Norchip	8.8	6.6	8.0	7.5	7.0	6.8	8.7	8.0
ND248-3Russ	8.8	8.2	6.5	6.0	7.6	6.5	8.7	7.6
ND206-1R	8.0	7.7	7.3	8.0	7.3	6.3	7.3	7.3
Bison	8.0	5.5	9.0	7.0	5.8	6.8	8.0	7.2

1/ Severe Sloughing - 1; No Sloughing - 10
2/ Not Mealy - 1; Very Dry and Mealy - 10
3/ Dark - 1; Very White - 10
4/ Dark - 1; Very White - 10
5/ Poor Flavor - 1; Excellent Flavor - 10

North Dakota Table 8. 1980 Cooking Tests of Cultivars and Selections Grown at Park River, North Dakota-1979.

	Boiling					Baking		
Cultivar	Sloughing[1/]	Mealiness[2/]	Color After Cooking[3/]	Color 4 Hours After Cooking[4/]	Flavor[5/]	Mealiness	Color	Flavor
Viking	9.7	8.8	9.3	9.0	8.6	7.3	9.3	8.7
ND8850-2	8.7	8.8	8.0	9.0	8.4	7.9	8.0	8.1
Norgold Russet	9.0	8.1	8.7	7.5	8.1	7.3	9.5	7.9
Norchip	9.0	8.6	8.0	6.0	8.4	8.4	9.0	7.9
Lemhi	7.7	7.8	9.0	8.5	7.1	7.6	9.3	8.1
ND137-2Russ	8.8	7.8	9.0	7.0	8.3	6.6	9.2	7.8
ND329-4Russ	9.7	6.0	9.0	7.5	7.9	7.1	9.0	7.8
Red Pontiac	9.0	6.5	8.0	8.5	8.1	7.1	9.0	7.7
Crystal	7.7	8.1	9.3	6.0	8.0	7.5	8.8	7.9
Russet Burbank	8.5	8.2	8.0	7.5	6.9	7.8	8.6	7.6
Bison	10.0	6.5	8.3	6.5	8.0	6.7	8.8	8.2
ND248-3Russ	8.7	7.2	8.7	7.0	7.6	7.3	9.3	7.2
Dakchip	9.3	8.0	8.0	5.0	8.2	7.1	9.0	8.2
AND7422-1Russ	6.3	8.1	7.7	10.0	8.0	7.3	7.8	7.2
ND206-1R	9.0	7.1	7.0	10.0	7.6	6.4	7.8	7.5
ND194-7	9.0	8.2	8.7	4.0	7.1	8.1	9.3	7.7
ND55-7	7.3	7.8	8.0	7.5	8.0	7.3	8.0	7.9
ND294-1R	8.5	7.6	8.0	5.5	8.3	6.5	8.6	8.0
ND9476-5	9.3	6.6	8.0	8.0	7.1	6.4	8.3	7.3
Norland	8.8	6.3	8.7	7.5	7.2	6.2	9.2	6.8
Kennebec	7.8	8.6	7.0	5.5	7.2	7.6	8.6	7.6
ND372-2R	7.7	7.8	8.7	3.5	7.9	7.8	8.3	8.0
ND119-3	9.0	6.4	8.0	6.0	7.0	7.0	8.8	7.3
ND258-1	6.3	7.6	8.0	7.5	7.9	7.8	8.3	8.0
ND146-4R	7.7	7.0	7.0	3.5	7.9	7.6	8.7	6.9

1/ Severe Sloughing - 1; No Sloughing - 10
2/ Not Mealy - 1; Very Dry and Mealy - 10
3/ Dark - 1; Very White - 10
4/ Dark - 1; Very White - 10
5/ Poor Flavor - 1; Excellent Flavor - 10

North Dakota Table 9. Russet Trial at Grand Forks, North Dakota - 1980.

Cultivar	Total Yield	No.1 Yield	Specific Gravity 1/	% Total Solids
ND534-4Russ	245	235	79	19.4
ND388-1Russ	176	163	83	20.3
ND639-9Russ	133	100	84	20.5
Belrus	125	102	85	20.7
ND534-8Russ	123	103	80	19.7
Allagash Russet	118	112	78	19.2
ND469-7Russ	101	46	84	20.5
AND74569-1Russ	80	39	82	20.1
Russet Burbank	106	70	80	19.7
Average	134	107	81	20.0

1/ 1.0 deleted.

North Dakota Table 10. Trial of Ethanol Lines Grown at Grand Forks, North Dakota - 1980[1/]

Cultivar	Total Yield	No. 1 Yield	% U.S. No. 1	Specific Gravity[2/]	Total Solids	% Carbo.	Gallon Ethanol/A	Value at $1.70/Gal.
Bounty	266	254	95	79	20.6	16.5	210	$357
A503-42	238	222	93	84	21.6	17.3	312	530
Neb. 12.72-2	237	201	85	64	17.6	14.3	257	437
Neb. 210-2	222	190	86	74	19.6	15.8	266	452
Red Pontiac	216	210	97	69	18.6	15.0	245	417
Neb. A129.69-1	193	174	90	72	19.2	15.5	227	386
ND9403-16R	190	179	94	76	20.0	16.1	232	394
WC612-3	189	178	94	90	22.8	18.2	261	444
Kennebec	186	174	94	73	19.4	15.6	219	372
ND329-4Russ	182	148	81	70	18.8	15.2	210	357
TND22-2	178	135	76	88	22.4	17.9	241	410
ND55-7	173	145	84	85	21.8	17.4	228	388
Lemhi	171	127	74	85	21.8	17.4	225	434
Crystal	168	160	95	83	21.4	17.1	180	306
Neb. 51-3	166	145	87	63	17.4	14.1	177	301
ND372-2R	132	103	78	85	21.8	17.4	174	296
ND206-1R	118	111	94	74	19.6	15.6	139	236
ND258-1	109	108	99	84	21.6	17.3	143	243
RB 307	106	84	79	84	21.6	17.3	139	236
ND612-9	95	85	89	82	21.2	17.0	122	207
B6987-201	70	60	86	88	22.4	17.9	95	162
Average	172	152	88	79	20.5	16.4	197	$337

1/ Trial planted May 12 and 19th; Harvested September 22 and 23; Fertilizer 22-22-12/200#/A

2/ 1.0 deleted.

NORTH DAKOTA

B. K. Hoag

POTATO VARIETIES

The potatoes had many growth cracks and cracked easily when dug because of the surplus moisture in August and September. Soft rot was common in Crystal, Dakchip, and Norgold Russet. Kennebec had some sunburned tubers. The potatoes were large, resulting in a very good yield average for 1980. Paraquat was applied to kill the vines.

Data are given in Table 1.

Table 1. Potato Variety Yields in 1980 - Minot, N. D.

Variety	Yield 1980	1979	1977	2-Yr. Avg.	3-Yr. Avg.	Days to 10% Bloom	Maturity[a]	% Solids	% U.S. No. 1	Total Yield
	----cwt/A of No. 1's----						0-5			cwt/A #1
Red Pontiac	260	136	280	198	225	69	4.0	18.2	96.3	270
Dakchip	250	74	257	162	194	62	4.1	20.1	93.2	268
Lemhi	257	---	---	---	---	65	5.0	21.6	96.5	266
Kennebec	252	105	293	179	217	66	5.0	19.4	96.2	262
Norchip	222	76	226	149	175	--	5.0	20.9	90.6	245
Russet Burbank	209	45	217	127	141	58	5.0	19.9	90.8	231
372-2R	219	---	---	---	---	67	4.0	21.2	96.6	227
Viking	209	133	252	171	198	64	4.0	19.9	98.1	214
55-7	191	---	---	---	---	56	4.5	22.4	91.8	208
Bison	172	99	190	136	154	62	3.8	20.5	87.4	197
Norgold Russet	182	68	200	125	150	51	3.0	19.7	94.2	193
Red Norland	183	98	224	141	168	63	1.5	18.8	96.9	189
Crystal	175	123	280	149	193	50	4.0	22.2	95.3	184
146-4R	150	100	---	125	---	57	0.8	20.3	92.0	163
TND 14-1	131	---	---	---	---	47	2.0	20.9	95.3	137
119-3	128	---	---	---	---	53	3.0	19.0	95.2	135
Mean =	199	---	---	---	---				93.9	212

[a] 0 = very early; 5 = very late

OHIO

James Pisarczyk, Floyd Lower, E. C. Wittmeyer, Randall Rowe, Donald Simonet, W. A. Gould and David Kelly

Potato Cultivar Trials, 1980

Over 25 potato varieties and advanced selections were evaluated in trials across Ohio in 1980. These trials included: 1) a Statewide Trial of 9 entries located on 6 commercial farms, 2) an Observational Trial of many newer entries located on two of the 6 commercial farms, 3) a trial of 10 entries at the OARDC Muck Crops Branch at Celeryville.

The work was sponsored by the Department of Horticulture of the Ohio Agricultural Research and Development Center and the Ohio State University in cooperation with the Ohio Potato Growers Association and commercial growers.

Nine entries were evaluated at 6 commercial farms located across the state. Seven of the entries (Crystal, Neb. A129.69-1, W 718, CA02-7, Denali, Michibonne, and Michimac) were included because they have looked promising in previous years, and the other two entries (Norchip and Katahdin) were included as standards. On two of the six farms, 21 other lots were tested in smaller triplicated plots on both farms to find promising new selections. The nine main varieties were also tested on muck soil at Celeryville.

Planting dates for the main study varied from April 26 to May 31, with delays due to the wet part of May. Katahdin and Norchip were used as standard varieties for comparison. Rainfall was adequate throughout the growing season with no usual prolonged dry periods. It was excessive at most times and places. On farms with sandy loam soils, yields were good and little damage resulted. On the other farms with silt and clay loam soils, several very heavy rains followed by lighter rains provided no period to dry the soil after the heavy rains, and much tuber rot was found in slightly lower spots. The rains were practically continuous throughout the growing season.

A Nebraska seedling, Neb. A 129.69-1, gave the highest average yield of U.S. No. 1 potatoes on the six farms with Denali second. W 718 and Michibonne followed. Crystal (ND 8891-3) which led in 1979 was average and was lower than normal for this variety, apparently due to the extremely wet growing season and low grades. It was second in total yield before grading for the six farms aveage. Norchip was lowest on four farms. Grades were very low, particularly for certain varieties.

Hollow heart was extremely bad this year. All of the varieties in the main trials had some hollow heart at three or more of the six farms, Norchip had the least followed by Neb. A 129.69-1. Denali was highest with 25% of the tubers cut showing hollow heart, CA 02-7 was second high with 22.5% and W 718 was third with 20%. Ten large tubers of each replicate were cut.

The three highest yielding varieties in the observation trials were Atlantic, NY59, and Dakchip. Atlantic had 35% hollow heart and the highest percentage of internal necrosis (5%) in the tuber samples cut at the two farms. NY59 had the largest tuber size of all varieties in the observation trial, 5.1 ounces. However, it had 28% hollow heart in the cut tubers. It had no internal necrosis but led in 1978. Dakchip had 6.5% hollow heart and tubers averaging 4.5 ounces. It has had above-average yields and no major problems in past trials.

In the muck trial, W 718 led in yield of U.S. No. 1 potatoes for the fifth consecutive year. Again, there was a high percentage of hollow heart in cut tubers. Michimac ranked second in yield and has done well in past trials. CA02-7 ranked third in yield and had only 7% hollow heart. Other selections with above-average yields were Jemseg which is an early maturing variety, and Neb. A129.69-1 which led in yield in the statewide trials. Michibonne, Denali, and Oceana did not look promising for production on muck soils.

OHIO TABLE 1. Average U.S. No. 1 yields, grades and stands -- Main Trials, 1980. (Listed in order of average yield of the six farms).

Entry	Avg. Yields cwt/A	Average Percent			Tuber wt. (oz)	Avg. % stand
		U.S. No.1	B-Size	Culls		
Neb. A129.69-1	320	79.7	5.9	14.0	4.3	92.1
Denali	316	82.5	5.7	11.5	4.9	91.2
W 718	296	81.5	4.4	13.5	4.7	85.8
Michibonne	291	80.4	2.4	17.0	5.9	91.3
Michimac	278	80.9	4.2	14.7	4.9	89.9
Crystal	273	69.3	4.5	26.0	4.8	90.7
Katahdin	267	78.8	5.4	15.5	4.8	89.1
CA 02-7	223	76.3	6.9	16.4	4.6	85.7
Norchip	201	68.3	9.9	21.4	3.6	92.3
Average	274	77.5	4.9	16.7	4.7	89.8

OHIO TABLE 2. Percentage of total tubers cut showing hollow heart and internal necrosis. Statewide Trial.

Entry	H.H.	NEC	Entry	H.H.	NEC
Crystal (ND 8891-3)	12.9	2.1	Katahdin	15.3	2.1
W718	20.4	5.4	Denali	25.4	2.1
Norchip	1.7	9.5	CA02-7	22.5	.8
Michimac	18.4	1.7	Neb. A129.69-1	6.6	.3
Michibonne	11.3	.44			

OHIO TABLE 3. Yield, grade, and tuber size of Observation Entries.

Entry	Yield (cwt/A)	% U.S. No. 1	Tuber Weight (oz)
Atlantic	247	85.6	4.5
NY 59	234	82.6	5.1
Dakchip	222	76.2	4.5
Superior	197	81.8	3.9
W 738	195	79.2	4.1
Neb. 51-3	195	76.3	4.2
Lemhi Russet	193	69.4	4.8
Kennebec	192	69.8	4.5
MS 402-1	192	83.6	4.3
MS 108-5	191	86.9	3.5
B7583-6	190	72.0	4.8
Neb. 63.71-1	188	75.0	4.9
B6987-184	173	79.0	4.0
Croatan	171	76.6	3.9
AF 41-2	166	78.3	4.2
MS 403-2	161	86.9	4.3
Allegash	150	74.8	4.2
Oceania	150	85.0	4.1
A70758-3	129	43.8	4.4

OHIO TABLE 4. Summary of percent hollow heart and internal nicrvsis of tubers cut - Observation Trial.

Hollow Heart

Severe (Over 15%)	Moderate (9 to 15%)	Slight (8% and under)
Atlantic	MS 403-2	AF 41-2
Oceania	W 738	AF 205-9
Jemseg	BelRus	Kennebec B
Allegash		Dakchip
N.Y. 59		Croatan
Neb. 63.71-1		
Lemhi Russet		
B 6987-184		
AK 28		
B 7583-6		

Necrosis

Severe (Over 5%)	Moderate (Over 3.5%)	Slight (1.5%)
Atlantic	B 7583-6	Kennebec B
		A 70758-3
		MS 108-5
		MS 402-1
		MS 403-2
		B 6987-184

OHIO TABLE 5. Yield and grade characteristics of entries in Celeryville Muck Trial.

Entry	Cwt/A		Percent			
	Total	US No. 1	US No. 1	B-Size	Culls	H.H.
W 718	385	346	89.9	7.2	2.9	40
Michimac	380	342	89.9	5.7	4.4	13
CA02-7	361	311	85.9	9.7	4.4	7
Jemseg	329	302	91.6	3.4	5.0	0
Neb. A129.69-1	339	295	86.8	8.6	4.6	7
Katahdin	315	268	84.9	9.1	6.0	0
Michibonne	285	255	89.4	6.3	4.3	5
Denali	302	247	81.7	10.0	8.3	40
Oceana	274	239	87.3	9.7	3.0	20
Superior	272	224	82.1	10.8	7.1	0

OREGON

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Eleven yield trials were conducted in Oregon in 1980. Results of two of these will be reported elsewhere in this progress report under the "Idaho and Eastern Oregon" segment.

Crops were grown using cultural practices common to the areas. The Madras and Klamath Falls sites are characterized by relatively short, cool growing conditions with the possibility of frost occurring any day of the year. Both locations are approximately 4,000 feet in elevation. The Columbia Basin (Hermiston) growing season is relatively long and warm; crops are planted as early as February and are harvested from mid-July through November depending on marketing goals. Growing conditions in Malheur (Ontario) County and the Willamette Valley (Corvallis) are moderate in terms of length of season with Malheur County being relatively warmer and drier. The Willamette Valley is somewhat unique in Oregon in that both planting and harvest can be seriously delayed by wet weather. Late blight occurs frequently in the Valley because of heavy fogs and light rains in August and September, but is almost unknown east of the Cascades.

Oregon growers are interested primarily in long russet potatoes for processing into french fries and other frozen products. However, some 2,500 acres of chipping potatoes are grown annually in the Willamette Valley and the Columbia Basin, and fresh market russet potatoes are still an important consideration in most Oregon producing areas, particularly the Klamath Basin.

Willamette Valley (Corvallis) Trial

Nineteen varieties and selections were evaluated at Corvallis in 1980 (Table 1). Seed was limiting for AK 28-8, B 6987-201, and NDD 47-1; all others were replicated four times. B 6987-201 and TND 14-1 were severely injured by metribuzin. Yields for these two entries, therefore, did not indicate their true potential.

Denali appeared to have considerable promise for chipping with good yields of high gravity tubers which chipped relatively light. Crystal and Monona also yielded well. Crystal chips were slightly darker than average, however, and tubers shrivelled badly in storage. Monona produced white chips as expected but flavor was somewhat bitter and tubers softened in storage. Norchip chips were extremely light-colored but tuber yields and storage life were unacceptable.

Lemhi and Nooksack appeared to have some promise for fresh market. Tubers of these varieties tended to be oblong-to-long and russeted. Both were inferior to R. Burbank in 1980, however, due to the unusually good performance of the latter.

Hermiston (Columbia Basin) Trials

Five trials were conducted at Hermiston in 1980. Two were established in commercial fields under center-pivot irrigation to accurately determine performance under commercial conditions. The remaining three were conducted at the Hermiston Experiment Station using cultural practices common to the Columbia Basin. One of the station trials (Western Regional) will also be reported in summary form elsewhere in this progress report.

Early Western Regional Trial

Ten varieties and selections were compared to Norgold for early fresh market at the Hermiston Station (Table 2). Entries were selected with emphasis on early, long russets.

Lemhi was by far the most promising entry. Both yield and grade-out were excellent and tubers were well matured at harvest (August 7). Skins were sufficiently set that skinning was minimal compared to several other entries. Numbered lines performed poorly except possibly for A 72602-2.

Western Regional Trial

Promising entries in the Hermiston Western Regional Trial included Lemhi, A 72545-2 and WC 521-12 (Table 3). The red entry, AC 67560-1, has performed well in previous tests but not in 1980, possibly due to poor seed. AD 7267-1 produced good yields, but specific gravity was relatively low and tubers were slightly susceptible to hollow heart.

Off-Station Trials

Seven varieties and selections were compared to Russet Burbank on two commercial farms near Hermiston. The plantings were situated in commercial fields and grown using cultural practices applied to the remainder of the field.

A 72545-2 yielded and graded well at both locations (Table 4). Specific gravities of A 72545-2 were slightly below average and some tendency toward scabbiness was noted. Shatter bruise was also mildly evident. Subsequent fry tests of A 72545-2 showed a tendency toward off-colors; this will be thoroughly evaluated in future tests.

B 6987-201 and Atlantic performed poorly. This was somewhat unusual for Atlantic which has yielded well in the Columbia Basin. WC 521-12 and WC 612-13 were moderately promising, but tuber type was generally not the typical long russet preferred by area growers and processors. Both WC selections were susceptible to scab and shatter bruise.

Lemhi performed well at both locations. Tubers were oblong and well russeted. Butte appeared to be promising at Eagle Ranch, but disappointing at Royal Farms. Reasons for this discrepancy were not clear.

Oregon Statewide Trial

The Oregon Statewide Trial--a systematic comparison of 40 entries--was conducted at the Hermiston (H), Klamath Falls (KF), Madras (M), and Ontario (O) stations in 1980 (Table 5). Entries were selected primarily from crosses made by the Aberdeen and Prosser breeding programs. Several named varieties were included for comparison.

Yields varied considerably among locations. In general, the Hermiston site produced highest yields followed by Ontario, Klamath Falls, and Madras, respectively. These yield variations among locations can probably be explained by differences in length of growing season as noted earlier. Entries appearing to have promise included: A 74404-3, 49 I 118, A 66102-12, A 69870-6, A 70270-3, A 72602-2, A 7403-3, A 7474-12, A 74124-3, Butte, Lemhi and Targhee (Table 5).

Table 1. Yield and Quality Characteristics of 19 Potato Varieties and Selections, Corvallis.

Entry	Yield, Cwt/A		Percent			Specific Gravity	Avg. Chip Color	Comments
	No. 1	Total	No. 1	4 oz.	Culls			
AK 28-8*	310	417	74.3	14.3	11.3	1.090	3.0	---
Allagash	231	297	77.3	11.4	11.3	1.079	3.0	Oblong, smooth russet
Atlantic	210	316	66.1	14.9	18.9	1.090	2.3	Smooth, round, semi-rus
B 6987-201*	42	82	50.7	26.1	23.1	--	3.0	Severe Sencor injury
Bintje	299	425	69.6	18.9	11.3	1.085	3.5	Yellow flesh, creamy tan skin, netted
Crystal	363	487	75.0	11.1	13.9	1.083	4.0	Round, white, some enlarged lenticels; GOOD
Dakchip	248	346	70.7	19.1	10.2	1.078	3.5	Round, white, small; skins feathered badly
Delta Gold	302	446	70.5	7.0	22.4	1.090	4.0	Large, white; yellow flesh; green; thick skins
Denali	368	442	83.2	8.3	8.3	1.099	3.2	Large, round; tan-skinned tubers; smooth; GOOD
FL 162	263	378	69.9	10.7	19.4	1.088	3.0	White; large, rough; cracks, greening
FL 1168	294	403	75.2	14.5	10.2	1.078	3.2	Attractive round semi-rus.; resembles Atlantic
Kennebec	346	491	70.6	3.5	25.6	1.090	3.5	Large, rough; green
Lemhi	356	453	76.5	8.1	15.3	1.089	3.0	Attractive long rus.; darker than Burbank
Monona	343	439	78.1	7.7	12.2	1.077	2.7	White; deep eyes; rough, large
NDD 47-1*	332	380	87.2	12.8	24.9	1.065	5.0	---
Nooksack	357	426	83.4	6.9	9.6	1.099	4.7	Oblong rus.; attractive
Norchip	196	314	62.3	24.0	13.6	1.086	2.2	Small, creamy white; round
R. Burbank	364	588	61.4	16.6	21.9	1.086	3.5	Very smooth for Burbank
TND 14-1	68	105	67.5	23.4	9.2	1.088	3.2	Oblong rus.; severe Sencor injury
Average	278	381	72.9	13.6	15.4	1.086	3.3	---
LSD .05	108	126	13.0	7.9	13.1	0.004	---	---

*unreplicated

Table 2. Yield and Performance, Early Western Regional Trial[1], Hermiston

Selection	Yield, cwt/A		Percent		Ave. wt.	Specific	Skin[2]	Comments[3]
	No. 1	Total	No. 1	No. 2	oz	Gravity	Feathering	
A 69870-6	334	403	83	9	7.6	1.066	1.4	Soft. Alligator skin
A 70283-24	260	373	70	16	7.6	1.068	1.6	Rots. Int. necrosis. Rough
A 72602-2	454	526	86	8	7.4	1.084	1.2	Att. rus. Soft, skinning
A 7465-8	203	270	75	11	7.6	1.085	0.4	Good. Long rus. Mature
Chieftain	513	569	90	5	7.6	1.066	2.5	Red. Soft
Lemhi	506	621	81	10	7.5	1.080	0.4	Beautiful; firm; thick skin
NDA 8694-3	363	461	79	11	6.4	1.075	1.0	Shrivelled. Light rus. Scab
NDA 9249-3	363	469	77	16	7.9	1.077	1.6	Severe skinning scab. Light color
Norgold	267	348	77	9	6.4	1.076	0.4	Thumbnail crack. Firm
Targhee	298	375	80	11	6.7	1.074	0.8	Some skinning
WN 630-5	229	351	65	21	11.3	1.078	1.5	Rots! Long white. Skins!
Average	344	433	78	11	7.6	1.075	1.1	
LSD .05	100	101	--	--	--	0.003	--	

[1] Planted March 27; harvested August 7.
[2] 0 = none; 3 = severe.
[3] Observations made on August 21, 17 days after harvest and storage at 45°F.

Table 3. Yield and Performance of Western Regional Entries, Hermiston.

Selection	Yield, cwt/A		Percent		Ave. wt.	Specific	Percent[1]		Comments
	No. 1	Total	No. 1	No. 2	oz	Gravity	HH	BC	
A 72545-2	533	582	92	3	11.2	1.083	0	0	Oval-shaped. Semi-rus. Smooth. netted skin. Susc. scab.
AC 67560-1	392	440	89	4	10.4	1.071	0	0	Red, round. Susc. scab. Rough. Dull color
AD 7267-1	537	623	86	9	14.3	1.074	4	0	Oblong-long rus. Good skin. Late. Shatters. Large!
AD 7377-1	474	552	86	7	14.2	1.072	6	0	Large, oblong rus. Smooth. Late?
Atlantic	463	496	93	2	9.3	1.092	5	7	Round, light rus. Shatters
B 6987-201	378	453	83	7	9.1	1.099	1	0	Round wh. to rus. Flat. Late or extremely susc. mech. inj.
Lemhi	567	645	88	8	13.9	1.087	0	0	Oblong, att. rus. Smooth
Norgold	343	407	84	0	7.9	1.071	--	--	
R. Burbank	378	563	67	21	9.6	1.091	5	23	Better than usual
WC 521-12	613	714	86	7	15.5	1.099	3	2	Round, semi-rus. Large. Susc. mech. inj! Chipper?
WC 612-13	558	613	91	5	12.3	1.091	0	1	Large, round white. Late? Scab
WC 672-2	553	593	93	2	11.9	1.086	6	20	Round, flat rus. Good skin. Slight scab
WD 641-10	184	228	81	2	8.3	1.080	1	0	Small, round rus. Late? Susc. fusarium rot?
Average	459	531	86	5.9	11.4	1.084	2.6	4.4	
LSD .05	119	135	--	--	--	0.003	--	--	

[1] HH = Hollow Heart; BC = Brown Center

Table 4. Performance of Eight Varieties and Selections Under Center-Pivot Irrigation, Hermiston

Entry	No. 1 Cwt/A[1]		Total Cwt/A		Specific Grav.		Comments[2]
	ER	RF	ER	RF	ER	RF	
A 72545-2	810	658	898	744	1.086	1.089	Long, lt. rus. SB
Atlantic	---	408	---	489	---	1.095	Round rus.
B 6987-201	435	---	526	---	1.094	---	Scab., thin skin
Butte	779	365	840	474	1.088	1.087	Oblong rus. scaby SB
Lemhi	785	564	816	749	1.092	1.089	Long rus., mild SC, GC
R. Burbank	687	332	811	506	1.084	1.084	-----
Targhee	693	465	746	575	1.086	1.087	Oblong rus., EH., SB
WC 521-12	742	496	843	676	1.092	1.104	Round, white, SC, SB
WC 612-13	795	652	841	784	1.092	1.098	Sev. scab. SB
Average	716	477	790	617	1.089	1.091	-----
LSD, .05	113	120	120	147	0.004	0.007	-----

[1]ER = Eagle Ranch; RF = Royal Farms

[2]lt. = light colored skin; SB = shatter bruise; SC = scab; GC = growth cracks

Table 5. Yield, Quality and Tuber Characteristics, Oregon State-Wide Trial.

Selection	Yield, cwt/A[1]				Specific Gravity			Comments[2]
	H	KF	M	O	H	KF	M	
49 I 118	690	459	185	482	1.084	1.090	1.076	Long rus. Late.
A 66102-12	663	365	327	270	1.091	1.096	1.085	Light rus. Late.
A 66107-51	629	319	216	395	1.082	1.087	1.080	Long, rough. Discard.
A 69327-5	564	324	198	411	1.086	1.093	1.081	Oblong rus. Knobs. Oiscard.
A 69870-3	660	399	329	487	1.083	1.089	1.081	R-O rus. OK. Thick skin.
A 69870-6	666	390	323	540	1.076	1.088	1.081	Round rus. Rough. Deep eyes.
A 69870-10	564	429	300	441	1.078	1.091	1.082	Huge! Rots. R-O rus.
A 70270-3	503	392	189	330	1.081	1.090	1.082	Oblong, good rus. Late?
A 70286-2	532	302	225	429	1.078	1.088	1.081	Oblong. Light rus.
A 70383-24	561	251	192	389	1.084	1.076	1.082	Long, rough. rus. Discard.
A 7273-3	660	303	235	483	1.080	1.082	1.080	R-O rus. Deep eyes. OK.
A 72545-2	---	406	284	387	---	1.093	1.082	Oblong light rus. OK.
A 72602-2	597	321	298	369	1.088	1.092	1.090	Oblong rus. Early? Good skin.
A 7346-11	417	173	135	270	1.076	1.083	1.081	Oblong rus. Smooth.
A 7403-3	692	326	309	458	1.087	1.094	1.083	R-O rus. Large, dark.
A 7465-8	223	125	155	213	1.084	1.086	1.088	AWFUL! Discard.
A 7474-12	610	342	199	551	1.081	1.087	1.090	Light rus. Cracks. Discard.
A 7497-3	547	289	145	283	1.083	1.091	1.087	Oblong, heavy rus. Keep.
A 74104-18	541	323	162	403	1.075	1.077	1.078	R-O. Light rus. Good.
A 74106-10	420	76	191	---	1.081	1.076	1.077	Oblong, heavy rus. Smooth.
A 74124-3	450	455	---	642	1.075	1.086	---	White, late. Metribuzin inj.
A 74127-2	537	335	295	298	1.084	1.089	1.087	Light rus. Late. Flat. R-O.
A 74129-4	595	292	233	451	1.070	1.074	1.077	R-O. Light rus. Good.
A 74195-2	573	347	254	424	1.084	1.086	1.082	Crescent-shaped. Discard.
A 74404-3	844	360	320	429	1.084	1.092	1.084	R-O. Light rus. Good.
AC 67560-1	537	325	145	289	1.071	1.077	1.073	Red. Large, round. Scab.
ALR 4-1	537	300	229	493	1.087	1.103	1.093	R-O. Light rus. Smooth.
Butte	627	342	321	425	1.090	1.091	1.085	Oblong rus. Smooth.
Chieftain	681	282	301	609	1.066	1.078	1.075	Red. Scab. Bright color.
Lemhi	653	345	207	551	1.087	1.095	1.090	Oblong rus. Dark. OK.
NDA 8694-3	421	201	146	382	1.072	1.073	1.080	Round, light rus. Rough.
Norgold	343	193	104	288	1.071	1.074	1.079	Small, round rus.
R. Burbank	495	285	197	---	1.085	1.092	1.089	Long, rough rus.
R. B., Gen. 1	520	318	174	587	1.087	1.092	1.086	-----
Targhee	732	275	276	250	1.086	1.093	1.082	R-O, heavy rus.
WC 435-3	374	260	238	428	1.082	1.087	1.073	Dark rus. Attached stolons.
WN 541-2	219	328	139	359	1.067	1.068	1.069	Dark, rough. Rots. Oiscard.
WN 630-5	597	355	260	455	1.085	1.091	1.087	Large, long white.
WN 641-11	255	229	193	290	1.078	1.089	1.084	R-O, light rus.
WN 701-14	480	263	266	336	1.090	1.098	1.089	R-O. Rough. Oiscard.
WN 720-2	524	250	214	394	1.089	---	1.084	R-O, rus. Good. Late?
LSD 0.05			91				0.005	
Average			228				1.082	

[1]US No. 1 potatoes. H = Hermiston; KF = Klamath Falls; M = Madras; O = Ontario.

[2]Observations based on Hermiston planting: R-O = round to oblong; rus = russet.

TEXAS

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development and Testing.

Seedling Program. Approximately 32,000 first year seedlings, representing 248 families, were grown for selection near Hereford in 1980, and 119 original selections were made from this material. Approximately one-fourth (8980) of the 1980 first year seedlings resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock, during the winter of 1978-79. The remainder were obtained from Joe Pavek in Idaho (10,206), Bob Johansen in North Dakota (10,533) and Florian Lauer in Minnesota (2100). The Texas program also supplied the North Dakota, Idaho and Colorado programs with second, third and fourth sized seedling tubers for selection.

Adaptation Trials. Some 822 entries were grown in replicated and nonreplicated trials at two locations in West Texas. This provided for testing both on sandy soil with center pivot irrigation (Olton) and on clay or tight soil (Hereford) where the furrow irrigation method is used. Not all entries were included at each locale. Selected trials are included in this report.

The variety and advanced selection trial at Olton (Table 1) was planted April 11 and harvested on August 18, with a similar trial planted at Hereford on March 20 and harvested August 2 (Table 2). The Olton trials were far superior to those at Hereford. Yields at Hereford were extremely low due to the extreme hot and dry conditions experienced during the growing season. The outstanding entries in the Olton trial were: Norgold "35", ND 388-1 Ru and NDA 8694-3. The Norgold Russet strains continue to cause some confusion among the growers, because several of them display a somewhat erratic performance from year to year. There is no question that they differ substantially from regular Norgold Russet in plant vigor, maturity and other characteristics. The performance of Norgold "M" was not as good as in previous years. Lemhi Russet (Dash-1), regardless of source, did not perform especially well. The new Maine Russet, Allagash Russet, performed moderately well. At Hereford, the performance of Lemhi Russet was very poor. In general, regular Norgold Russet performed much better than did the strains.

Advanced selections from various breeding programs were tested under Texas conditions, as can be seen in Table 3. Several of these entries performed well relative to the check varieties. Those deserving mention, based on overall performance, include: ND 146-4R, NDD 277-2W and MnTX 8-57-1 Ru.

A number of advanced selections showed promise based on their performance at Olton (Table 4) and they will be retested in 1981. The primary objective of the Texas Potato Variety Development Program is the development of superior russet varieties specifically adapted to Texas growing conditons.

Texas Table 1. Total yield, percent of tubers over 4 ounces, average weight per tuber, specific gravity, vigor, maturity, and general rating of 37 potato varieties or selections grown at Olton, Texas - 1980.

Variety or Selection	Total Yield CWT/A	Percent of Tubers over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor 1/	Maturity 2/	General Rating 3/
ND 534-4 Ru	500.7	70.8	9.0	1.060	3.5	4.2	3.6
Norgold "35"	440.5	75.4	6.6	1.059	3.7	3.5	4.0
ND 388-1 Ru	421.4	74.5	6.6	1.063	3.2	3.5	3.9
NDA 8694-3	419.6	72.7	7.6	1.059	3.4	4.3	4.2
ND 9474-6	391.2	79.8	6.9	1.063	3.4	3.8	3.7
ND 635-2 R	382.7	71.5	6.2	1.057	3.0	4.0	3.3
ND 506-7 R	381.6	80.6	5.4	1.058	3.3	3.4	3.6
Red LaSoda	373.8	78.4	7.9	1.055	3.6	3.0	3.9
Norgold "L"	372.0	67.1	6.6	1.053	3.5	3.7	3.7
NDTX 5-177-2 W	369.4	74.6	7.1	1.057	3.0	4.0	3.5
A 63.71-1	360.7	57.1	4.9	1.055	3.5	2.7	3.5
Norgold Russet	346.7	64.4	5.7	1.064	2.9	3.7	3.7
Late Dark Red Norland	337.7	69.8	5.6	1.054	2.9	3.8	3.0
Norgold "M"	334.5	57.7	5.2	1.056	3.7	3.4	3.5
Allagash Russet	318.6	90.0	8.7	1.062	3.6	4.5	3.7
A 71.721	315.4	52.3	5.1	1.065	3.7	3.3	3.3
MnTX 8-57-1	314.2	46.3	4.4	1.054	3.4	3.5	3.5
Norgold "10"	310.2	61.8	5.5	1.056	3.5	2.7	3.2
TXND 6-14-1 Ru	285.8	75.3	6.8	1.059	2.7	3.6	3.8
WD 641-10	272.4	73.0	7.0	1.064	3.2	4.1	3.6
ND 392-4 Ru	271.8	66.7	7.1	1.048	2.6	3.0	3.7
ND 294-1 R	267.8	69.6	5.2	1.057	3.1	4.3	2.7
Lemhi Russet (Nebraska)	266.0	62.0	6.4	1.069	3.8	2.9	3.6
TX 7-294-1 Ru	265.4	54.2	4.4	1.063	3.3	3.0	3.0
A 103.72-1	263.4	51.7	4.9	1.055	3.9	2.8	3.3

Continued

Texas Table 1. Continued

ND 206-1 R	262.8	72.6	5.8	1.059	3.2	3.6	3.0
Norgold "7"	255.3	43.5	4.4	1.055	3.3	3.0	3.3
ND 450-11 Ru	252.7	38.7	5.2	1.059	3.1	4.5	3.3
A 210-2	252.7	46.1	4.2	1.064	3.8	3.3	3.0
Norgold "19"	250.9	52.2	5.4	1.057	3.7	2.9	3.3
ND 467-3 W	248.6	63.1	4.0	1.055	2.8	4.4	2.4
A 72685-2	248.6	65.1	5.3	1.065	3.9	2.5	3.4
Lemhi Russet (Idaho)	245.7	71.7	8.4	1.064	3.6	3.3	3.3
A 69.721	244.2	77.2	8.1	1.061	3.5	3.3	3.8
Neb 42-1	216.9	38.6	4.2	1.058	3.5	3.0	2.6
Neb 498	214.6	36.0	4.1	1.059	3.7	2.8	2.8
TX Late Norgold	194.6	63.7	6.2	1.052	3.5	2.9	3.0
Average	310.0	64.0	6.0	1.059	3.4	3.5	3.4
L.S.D. (.05)	65.8	9.9	1.1				

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

Texas Table 2. Total yield, percent of tubers over 4 ounces, average weight per tuber, specific gravity, vigor, maturity and general rating of 37 potato varieties or selections grown at Hereford, Texas - 1980.

Variety or Selection	Total Yield CWT/A	Percent of Tubers over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor 1/	Maturity 2/	General Rating 3/
ND 9474-6	214.3	64.0	4.7	1.060	2.6	3.0	3.4
ND 467-3	210.5	42.7	2.8	1.072	2.0	3.3	3.0
Norgold Russet	207.1	45.5	3.1	1.054	2.9	4.0	3.5
ND 635-2 R	195.7	60.7	4.2	1.055	2.8	3.5	3.5
ND 294-1 R	192.3	59.0	3.9	1.056	2.3	3.6	3.3
ND 534-4 Ru	184.4	35.0	3.0	1.061	2.8	3.0	3.0
Norgold "19"	183.8	45.6	3.8	1.056	2.9	3.5	3.0
NDA 8694-3	178.6	49.4	3.3	1.055	2.4	3.6	3.5
Norgold "L"	171.1	48.3	3.1	1.053	3.0	3.5	3.3
A 71.721	169.3	49.2	3.7	1.059	3.5	2.9	3.7
Norgold "7"	167.6	42.7	3.1	1.048	2.8	3.5	3.2
Norgold "35"	167.3	42.0	2.9	1.054	3.0	3.5	3.3
ND 388-1 Ru	165.8	53.1	3.6	1.060	2.7	3.2	3.4
NDTX 5-177-2 W	163.2	65.0	4.6	1.057	2.0	3.8	3.5
Allagash Russet	162.3	63.8	4.3	1.054	2.8	3.6	3.0
Norgold "M"	159.4	40.8	2.6	1.056	2.9	3.3	3.0
ND 506-7 R	158.0	50.3	2.8	1.052	2.4	3.0	3.3
A 210-2	151.0	44.3	2.8	1.065	3.0	3.2	3.0
Norgold "10"	145.5	40.4	2.7	1.046	3.0	3.0	3.4
TX 7-294-1 Ru	145.2	48.2	2.8	1.063	2.7	3.0	3.0
Lemhi Russet (Idaho)	145.0	50.5	3.6	1.063	3.0	2.4	3.5
Neb 42-1	143.8	19.7	2.1	1.061	3.4	2.5	2.9
Red LaSoda	138.8	46.3	3.6	1.050	3.3	2.6	3.0
A 69.721	133.3	64.7	4.6	1.059	3.0	2.9	3.5
Late Dark Red Norland	131.0	57.7	3.7	1.050	2.0	2.9	2.9

Continued

Texas Table 2. Continued

ND 206-1 R	126.3	52.0	3.1	1.056	2.3	3.6	2.9
TXND 6-14-1 Ru	125.2	36.8	2.9	1.052	2.0	3.3	3.0
TX Late Norgold	118.5	55.1	3.2	1.053	3.0	3.0	3.3
MnTX 8-57-1	116.5	46.2	4.5	1.058	3.3	3.0	3.5
WD 641-10	115.3	49.6	3.8	1.059	2.8	3.0	3.3
ND 450-11 Ru	107.2	26.1	2.4	1.057	2.3	3.3	3.0
A 63.71-1	105.2	41.1	2.7	1.055	3.0	2.5	3.5
ND 392-4 Ru	102.2	27.9	2.6	1.052	1.3	3.3	3.0
Neb 498	102.0	22.5	1.9	1.065	3.0	2.8	3.0
A 72685-2	99.9	57.2	3.9	1.059	3.5	2.8	2.9
Lemhi Russet (Nebraska)	96.4	38.3	2.3	1.057	3.4	2.6	3.3
A 103.72-1	36.6	10.7	1.3	1.055	3.5	2.0	2.8
Average	146.9	45.8	3.2	1.057	2.8	3.1	3.2
L.S.D. (.05)	29.6	11.1	1.0				

1/ 1 = poor or weak, 2 = fair, 3 = medium 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

Texas Table 3. Total yield, percent tubers in 2 size grades, average weight per tuber, vigor, maturity and general rating of 21 advanced selections from breeding programs in California, Idaho, North Dakota, Minnesota and Texas and 2 check varieties of potatoes grown at Olton, Texas - 1980.

Selection or Check Variety	Total Yield CWT/A	Percent Tubers by Number		Average Weight/ Tuber in oz.	Vigor 1/	Maturity 2/	General Rating 3/
		Under 2 in.	Over 2 in.				
ND 146-4 R	679.5	57.9	42.1	8.2	2.8	4.5	3.8
Red LaSoda	665.6	30.0	70.0	10.2	4.0	2.8	4.0
ND 258-1 W	663.9	45.1	54.9	8.0	3.2	3.8	3.3
ND 58-3 W	639.5	69.7	30.3	5.2	3.3	3.7	2.8
NDD 277-2	578.5	35.5	64.5	9.5	4.3	2.8	3.5
Norgold Russet	508.8	72.8	27.2	6.5	3.5	4.0	3.2
MnTX 8-57-1 Ru	493.1	53.6	46.4	8.1	3.3	3.8	3.5
ND 88-9 R	487.9	60.6	39.4	6.1	3.0	4.5	3.2
NDD 443-4	487.9	53.4	46.6	7.5	2.9	3.7	3.0
ND 292-1 W	482.7	43.2	56.8	6.6	3.8	3.5	3.7
ND 291-3 W	481.0	48.4	51.6	7.5	3.5	4.0	3.5
9 TXNR-4	461.8	66.6	33.4	5.7	4.0	2.5	2.3
NDD 452-1	400.8	43.0	57.0	8.6	2.4	3.9	2.7
ND 119-3 W	395.5	67.1	32.9	6.2	2.8	4.5	2.9
9 TXNR-0	390.3	85.0	15.0	6.0	3.3	3.5	2.5
ND 312-3 W	360.7	61.3	38.7	7.6	3.0	4.5	2.9
ND 55-7 W	346.7	55.2	44.8	6.5	3.5	3.3	2.7
AND 7422-1 Ru	341.5	81.3	18.7	6.5	3.2	4.3	2.3
9 TXNR-3	278.8	100.0	0.0	4.5	4.0	2.0	2.0
ND 329-4 Ru	250.9	68.0	32.0	6.6	2.7	4.3	2.5
9 TXNR-0 Reg	238.7	66.4	33.6	10.5	2.0	3.9	2.3
AND 74569-1 Ru	209.1	100.0	0.0	7.1	3.0	3.0	2.2
9 TXNR-2	174.2	100.0	0.0	5.3	2.0	4.0	2.0

Continued

Texas Table 3. Continued

Average	476.1	63.7	36.3	7.2	2.3	3.4	2.9
L.S.D.(.05)	133.9	18.3	18.3	1.9			

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

Texas Table 4. Total yield, percent tubers in 2 size grades, average weight per tuber, vigor, maturity and general rating of 41 Idaho-Texas, North Dakota-Texas, Minnesota-Texas and Texas advanced selections (Texas seed) and 2 check varieties of potatoes grown at Olton, Texas - 1980.

Selection or Check Variety	Total Yield CWT/A	Percent Tubers by Number		Average Weight/ Tuber in oz.	Vigor [1/]	Maturity [2/]	General Rating [3/]
		Under 2 in.	Over 2 in.				
Red LaSoda	740.5	28.0	72.0	9.5	3.9	3.3	3.5
NDTX 8-731-1 R	630.8	59.6	40.4	5.2	3.0	3.3	3.0
NDTX 8-531-2 R	548.9	37.6	62.4	8.1	3.3	3.2	3.2
NDTX 8-666-1 Ru	533.2	63.9	36.1	6.0	2.8	4.0	2.9
NDTX 8-349-1 R	496.6	56.4	43.6	5.8	3.5	3.9	2.9
ATX 8-71881-2 Ru	491.4	41.9	58.1	7.5	3.7	3.7	3.0
NDTX 8-402-1 Ru	487.9	48.6	51.4	7.9	3.5	3.7	2.9
TX 8-386-1 Ru	477.4	54.9	45.1	9.0	3.5	3.8	2.5
NDTX 8-418-1 Ru	461.7	66.1	33.9	5.7	2.9	3.5	2.8
MnTX 8-38-1 W	454.8	63.6	36.4	5.4	3.0	5.0	2.8
NDTX 8-462-3 R	433.9	51.5	48.5	6.3	2.8	4.5	2.5
NDTX 8-402-2 Ru	430.4	72.5	27.5	5.0	3.7	3.8	2.8
ATX 8-711028-1 Ru	428.6	82.3	17.7	4.5	3.3	3.3	2.3
NDTX 8-304-3 Ru	425.2	64.3	35.7	5.4	2.4	3.5	2.5
ATX 8-71882-1 Ru	425.2	57.6	42.4	6.1	2.3	3.3	2.7
ATX 8-71877-1 Ru	420.0	62.9	37.1	6.0	3.7	3.8	2.5
NDTX 8-349-4 R	418.2	62.1	37.9	4.7	3.7	3.9	2.9
NDTX 8-332-1 Ru	416.4	69.0	31.0	5.5	2.5	3.9	3.0
ATX 8-71881-1 Ru	413.0	59.5	40.5	8.0	3.8	2.9	2.9
ATX 8-711017-2 Ru	402.5	78.0	22.0	4.7	3.3	3.3	2.5
MnTX 8-42-1 Ru	400.8	53.8	46.2	6.8	3.5	2.4	3.0
MnTX 8-44-1 Ru	393.8	84.9	15.1	4.5	2.9	3.8	2.3
ATX 8-71878-1 Ru	388.6	82.6	17.4	4.5	3.7	2.5	2.5
MnTX 8-64-1 Ru	359.0	76.6	23.4	4.9	3.5	3.5	2.7
Norgold Russet	350.2	53.4	46.6	7.2	3.5	3.8	2.7

Continued

Texas Table 4. Continued

MnTX 8-44-2 Ru	346.7	47.2	52.8	6.0	2.4	4.5	2.9
MnTX 8-57-1 Ru	343.3	76.8	23.2	4.1	3.0	3.8	2.7
MnTX 8-38-3 Ru	341.5	66.6	33.4	5.0	3.0	4.5	2.8
MnTX 8-547.76-1 Ru	341.5	80.1	19.9	4.3	3.8	3.8	2.0
ATX 8-71887-2 Ru	334.5	76.4	23.6	5.2	3.2	4.0	2.8
TX 8-480-1 Ru	331.1	57.3	42.7	6.2	2.8	3.3	2.3
ATX 8-71876-1 Ru	331.1	67.8	32.2	4.9	3.3	2.4	2.8
NDTX 8-474-3 R	315.4	61.8	38.2	5.3	2.9	3.3	2.5
TX 8-473-1 Ru	308.4	69.9	30.1	6.1	2.9	3.2	2.7
TX 8-458-2 Ru	296.2	86.6	13.4	4.9	3.2	3.8	2.7
NDTX 8-606-1 Ru	292.7	75.7	24.3	5.0	2.4	4.0	2.5
ATX 8-711017-1 Ru	282.3	100.0	0.0	4.6	3.8	2.4	2.3
MnTX 8-38-4 Ru	278.8	74.4	25.6	5.3	2.9	3.5	2.7
MnTX 8-44-5 Ru	271.8	74.9	25.1	5.3	2.9	3.4	2.7
ATX 8-71882-2 Ru	270.1	70.2	29.8	5.0	2.9	3.3	2.2
TX 8-458-1 Ru	259.6	81.4	18.6	7.2	3.5	2.8	2.3
ATX 8-71995-1 Ru	254.4	68.3	31.7	6.7	3.5	3.8	2.3
TX 8-492-1 Ru	228.3	79.0	21.0	4.9	2.8	4.0	2.5
Average	392.0	66.2	33.8	5.8	3.2	3.6	2.7
L.S.D.(.05)	143.1	22.7	22.7	2.0			

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

VERMONT/NEW HAMPSHIRE

BY: S. C. Wiggans, R. N. Jensen, O. S. Wells, and H. J. Murphy

During 1980, two variety trials were conducted in Vermont by the Plant and Soil Science Department of the University of Vermont, the Plant Science Department of the University of New Hampshire, the Plant Industry Division of the Vermont Department of Agriculture, and the Plant and Soil Sciences Department of the University of Maine. One trial was located in South Burlington, Vermont and one in Guildhall, Vermont. There were six replicates in a randomized block design at each location. Seed pieces of all varieties were planted by hand. Seed piece spacing was 9 inches apart, except Russet Burbank, which was planted 16 inches apart. These trials were part of the Maine-New Hampshire-Vermont cooperative agreement, and were conducted in cooperation with NE-107 (Cooperative Northeast Region Potato Variety Trials) and in cooperation with the National Potato Breeding Program.

The plot at South Burlington was planted May 21, and harvested September 26, 1980 (Table 1). Fertilizer was broadcast at 160-320-320 per acre and disked-in prior to planting. Potatoes were grown in a light, sandy soil. Weed control was good. The season was dry, however, irrigation was applied as needed.

The plot at Guildhall was also planted May 21, killed September 10, and harvested September 30, 1980 (Table 2). Fertilizer was applied in the furrow at a rate of 160-240-240 per acre. Potatoes were grown in medium, loamy soil. Weed control was good. The early season was dry. One supplementary irrigation of 1½" of water was applied.

Chip color indicies for potato varieties at the two locations given in Table 3.

The five highest yielding varieties at South Burlington were Atlantic, Bake King, BR 7093-23, Kathadin and Denali. The five highest yielding varieties at Guildhall were BR 5991-WV116, Kathadin, Denali, Belchip, and Campbell 13. Kathadin and Denali were high yielding varieties at both South Burlington and Guildhall.

Table 1 Yield, percentage of yield in two grade size classes, specific gravity, and percent total solids for 20 potato varieties grown at South Burlington, Vermont - 1980.

Variety[1]	Yield above 1½ inches Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific gravity	Percent total solids
Allagash Russet	256	94.2	67.3	1.064	16.84
Atlantic	357	97.8	81.5	1.079	20.00
Bake King	336	93.8	56.3	1.074	18.95
Batoche	246	94.7	70.2	1.066	17.26
Bison	245	97.0	75.2	1.060	15.99
Campbell 13	234	94.8	71.1	1.064	16.84
Cobbler	314	94.5	72.9	1.066	17.26
Denali	317	95.5	78.9	1.080	20.21
Green Mountain	282	94.9	66.6	1.073	18.74
Jemseg	212	97.6	84.4	1.065	17.05
Katahdin	328	98.1	86.6	1.064	16.84
Kennebec	319	97.2	82.4	1.069	17.89
Norland	247	95.3	67.6	1.051	14.09
Peconic	307	96.8	78.1	1.073	18.74
Pungo	256	96.4	82.1	1.070	18.10
Russet Burbank	256	88.6	44.6	1.072	18.53
Superior	248	96.3	77.6	1.067	17.47
Tobique	272	95.6	71.8	1.068	17.68
BR7093-23	332	97.2	80.1	1.067	17.47
CA02-7	212	95.1	67.8	1.067	17.47
Bayes L.S.D. (0.05)	58			0.003	

[1]Planted - May 21; harvested - September 26, 1980.

Fertilization: 160-320-320. Russet Burbank spaced 16 inches; all other varieties spaced 9 inches apart.

Table 2 Yield, percentage of yield in two grade size classes, specific gravity, and percent total solids for 20 potato varieties grown at Guildhall, Vermont - 1980.

Variety[1]	Yield above 1½ inches Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/4 to 4 inches	Specific gravity	Percent total solids
Allagash Russet	356	95.3	77.6	1.062	16.42
Belchip	460	97.4	88.4	1.073	18.74
BelRus	284	50.8% 4 - 10 oz. size		1.072	18.53
Buckskin	386	95.2	83.5	1.067	17.47
Campbell 13	447	89.2	78.1	1.072	18.53
Delta Gold	226	91.9	79.8	1.072	18.53
Denali	474	94.9	85.6	1.083	20.85
Jemseg	368	90.5	84.9	1.063	16.63
Katahdin	487	89.4	83.8	1.062	16.42
Kennebec	406	95.3	81.6	1.069	17.89
Pungo	415	88.6	75.8	1.069	17.89
Russet Burbank	323	64.4% 4 - 10 oz. size		1.068	17.68
Shepody	361	47.6% 4 - 10 oz. size		1.069	17.89
AF92-3	413	96.0	85.5	1.064	16.84
BR5991-WV16	493	94.7	79.0	1.069	17.89
CA02-7	426	96.3	79.1	1.067	17.47
CD106-16	351	94.5	82.9	1.071	18.32
F67128	421	95.6	83.3	1.065	17.05
F68036	324	94.7	79.6	1.064	16.84
F69026	341	95.8	75.8	1.062	16.42
Bayes L.S.D. (0.05)	88			0.004	

[1]Planted - May 21; killed - September 10; harvested - September 30, 1980.

Fertilization: 160-240-240.

Seedpiece spacing: Russet Burbank spaced at 16 inches; all other varieties spaced at 9 inches apart.

Table 3 Chip color indices for 31 potato varieties grown at two locations in Vermont - 1980.

Variety	Location and Chip Color[1]	
	South Burlington	Guildhall
Allagash Russet	6.7	6.7
Atlantic	7.4	
Bake King	7.9	
Batoche	9.0	
BelRus		8.1
Belchip		8.2
Bison	7.7	
Buckskin		8.2
Campbell 13	7.8	8.8
Cobbler	8.0	
Delta Gold		9.6
Denali	7.5	9.0
Green Mountain	9.2	
Jemseg	8.1	8.7
Katahdin	7.7	9.2
Kennebec	7.2	9.2
Norland	9.1	
Peconic	6.4	
Pungo	8.3	9.8
Russet Burbank	8.9	9.3
Shepody		9.2
Superior	7.1	
Tobique	6.6	
AF92-3		9.1
BR5991-WV16		9.2
BR7093-23	6.7	
CA02-7	7.6	8.7
CD106-16		9.1
F67128		10.0
F68036		9.9
F69026		7.9
Bayes L.S.D. (0.05)	0.8	0.6

[1]Chips with lower indices are lighter in color.

VIRGINIA

Boyett Graves and Carroll P. Savage, Jr.

POTATO VARIETY DEVELOPMENT AND TESTING

Plot culture: Potato seedlings and varieties were evaluated at the Virginia Truck and Ornamentals Research Station on Virginia's Eastern Shore. Plots in the Advanced Trials (Tables 1 and 4) were replicated 5 times; those in the Intermediate Trials (Tables 2 and 5) were replicated 4 times; and those in the First Year Observational Trials (Tables 3 and 4) were single 18-hill rows.

Seed were cut, treated with maneb 8 percent seed treater and planted within 4 days. Plots received 120 lbs./A N, P, and K and 30 lbs./A timik 10Gb and placed at planting. One foliage spray for Colorado potato beetles was required. 1980 was a very dry production season after early May. Plots were irrigated three times with approximately 1-1/4 inches of water each time.

Plots were planted in early March and harvested July 9, 10, and 11. Specific gravity determinations were made July 11 and 12.

Samples from three replications of all trials, except the First Year Observational Trial, were taken and mixed into one representataive sample for chip color determinations. Chip color data were taken by J. W. Watts, Wise Foods, Berwick, Pennsylvania.

Virginia Table 1. Potato Varieties and Seedlings - Advanced Trial, Round Whites.

Variety	Yield Cwt/A 1-7/8" +	Ounces per Tuber	Specific Gravity[6]	Maturity[4]	Shape[1]	Confor-mation[2]	Sprouts[3]	Chip Color[5] Wks. after Harvest 0	1	2	3	Avg
L 42-38	176 a*	4.9	1.075	7	2	7	9	4	3	4	3	3.0
C 73132-2	173 ab	4.9	1.075	6	2	8	9	3	3	3	4	3.3
Atlantic	171 abc	4.8	1.088	7	1	6	9	2	2	3	3	2.5
B 8884-7	165 abc	4.7	1.080	7	3	6	9	2	2	4	4	3.0
Superior	158 a-d	5.4	1.077	3	2	7	9	2	3	3	2	2.5
B 8710-1	156 a-d	4.9	1.073	6	3	6	9	2	3	4	2	2.8
B 9140-14	155 a-d	-	1.083	4	2	7	9	2	3	3	2	2.5
B 6969-2	151 a-e	5.5	1.073	3	2	7	9	2	3	2	3	2.3
B 9062-9	151 a-e	5.7	1.071	7	2	5	5	1	3	4	2	2.5
B 8087-6	150 a-e	5.4	1.068	5	2	8	9	6	4	4	4	4.5
Pungo	149 a-e	5.5	1.077	7	2	6	6	2	4	4	4	3.5
La Chipper	144 a-e	4.7	1.073	5	2	6	9	3	4	3	5	3.8
B 9067-6	144 a-e	4.6	1.078	7	2	8	8	4	5	4	5	4.5
B 8907-4	142 a-e	6.1	1.072	4	1	7	9	2	1	3	2	2.0
Belchip	140 a-e	4.8	1.071	8	2	6	9	1	2	4	3	2.5
B 9192-1	139 a-f	5.5	1.076	5	2	6	7	2	2	3	2	2.3
B 8724-2	136 a-g	4.2	1.077	7	3	7	9	2	2	3	3	2.5
B 9138-29	135 a-g	4.5	1.078	7	2	7	8	2	2	4	4	3.0
B 8615-2	135 a-g	4.5	1.087	5	2	8	8	3	2	3	3	2.8
FL 774	133 a-g	4.6	1.076	4	2	5	9	3	4	4	3	3.5
B 8091-8	129 a-g	4.7	1.075	7	2	6	9	2	3	4	3	3.0
Norchip	124 b-g	4.8	1.078	5	2	6	7	2	3	3	3	2.8
B 8618-5	122 c-g	5.0	1.077	6	3	6	9	2	2	3	2	2.3
Ontario	121 c-g	3.9	1.061	8	3	5	5	5	3	5	5	4.5
FL 162	118 c-g	4.6	1.071	8	3	7	8	5	3	2	3	3.3
B 6987-184	116 c-g	4.1	1.082	8	4	6	9	2	2	3	3	2.5
B 9048-7	116 c-g	5.8	1.063	7	3	6	5	4	2	3	5	3.5
B 8799-13	116 c-g	5.0	1.081	3	1	7	9	2	1	3	2	2.0
B 8498-9	116 d-g	4.6	1.079	6	2	6	9	2	3	3	3	2.8

Virginia Table 1 (cont'd). Potato Varieties and Seedlings - Advanced Trial, Round Whites.

Variety	Yield Cwt/A 1-7/8" +	Ounces per Tuber	Specific Gravity[6]	Maturity[4]	Shape[1]	Conformation[2]	Sprouts[3]	Chip Color[5] Wks. after Harvest 0	1	2	3	Avg
B 9197-7	114 d-g	-	1.066	6	2	6	9	3	3	4	3	3.3
B 9325-4	113 d-g	4.9	1.085	7	1	8	9	1	2	4	3	3.3
B 9130-24	113 efg	4.3	1.078	6	2	7	8	3	3	3	2	2.8
B 7805-1	103 efg	4.4	1.074	5	3	7	8	3	2	4	4	3.3
B 8943-4 (Rus.)	103 efg	4.9	1.075	6	6	5	6	3	4	3	5	3.8
B 9053-6	103 efg	4.5	1.072	4	2	8	9	2	2	3	2	2.3
B 8285-3	91 fgh	5.3	1.077	4	6	5	5	-	-	-	-	-
B 8599-42	89 gh	4.1	1.065	6	2	7	9	2	2	3	4	2.8
B 8528-2 (Rus.)	59 h	4.0	1.081	4	7	6	8	-	-	-	-	-

[1]Shape: 1 = very round, 3 = round to oblong, 5 = oblong, 7 = oblong to long, 8 = long, 9 = very long.

[2]Conformation or overall appearance: 1 = very poor, 5 = fair, 7 = nice or good, 9 = exceptionally good.

[3]Sprouting at harvest: 1-6 = very bad to quite objectionable, 8 = very few sprouts, 9 = none.

[4]Maturity (vine maturity not size): 1 = extremely early, 3 = fairly early (Superior), 5 = midseason (slighlty later than Pungo), 7 = late, 9 = very, very late.

[5]Chip Color: 1 = very, very light, 5 = light brown (barely marketable, objectionable, 6-12 = brown to black (unmarketable).

[6]Specific gravity determined by weight in air-weight in water method.

*Duncan's Multi Range, 5%.

Virginia Table 2. Potato Seedlings and Varieties, 1980 - Intermediate Trial, Round Whites.

Variety	Yield Cwt/A 1-7/8" +	Specific Gravity[6]	Maturity[4]	Shape[1]	Confor-mation[2]	Sprouts[3]	Chip Color[5] Wks. after Harvest 0	1	2	3	Avg
Pungo	205 a*	1.077	6	2	6	8	2	5	4	2	3.2
Atlantic	199 ab	1.083	8	1	7	9	2	2	3	3	2.5
B 8514-8	198 ab	1.071	8	2	7	9	2	3	3	3	2.8
B 9138-3	193 abc	1.068	7	1	7	9	2	3	3	3	2.8
B 9152-44	186 abcd	1.070	6	1	8	9	2	4	5	6	4.3
B 9286-4	184 a-e	1.066	5	2	7	9	4	5	5	5	4.8
Norchip	179 a-f	1.078	5	3	5	9	2	2	3	2	2.3
B 9311-7	176 a-f	1.076	5	2	-	9	2	3	3	2	2.5
B 9224-6	174 a-f	1.077	5	2	6	9	2	3	5	2	3.0
B 9139-1	171 a-g	1.067	8	3	6	9	2	4	4	3	3.3
B 8352-3	170 a-g	1.072	5	2	6	9	-	-	-	-	-
B 8685-4	169 a-g	1.072	8	3	5	5	2	3	7	5	4.3
B 6987-184	169 a-g	1.082	7	3	5	9	1	3	3	3	2.5
B 8995-5	166 a-h	1.080	6	3	5	7	4	5	5	5	4.8
Belchip	163 a-h	1.068	7	2	5	9	2	2	2	2	2.0
Superior	162 a-h	1.074	4	2	7	9	2	3	3	2	2.5
B 9197-7	161 a-h	1.062	6	1	7	9	2	2	4	4	3.0
B 8943-4	160 a-h	1.072	7	6	4	9	Russet				
PAB 8824-6	159 a-h	1.073	6	1	6	9	2	2	2	3	2.3
B 9140-2	158 a-h	1.075	4	1	7	7	-	-	-	-	-
B 9071-1	150 b-i	1.071	7	2	5	9	-	-	-	-	-
B 9016-16	145 c-j	1.061	6	2	6	6	-	-	-	-	-
B 7839-7	142 d-j	1.067	6	2	8	9	2	3	4	3	3.0
B 9142-11	139 d-j	1.084	7	2	6	8	-	-	-	-	-
B 9130-34	135 e-j	1.067	4	3	5	6	-	-	-	-	-
B 9258-2	135 e-j	1.077	3	2	7	6	2	3	3	2	2.5
B 9146-1	132 f-k	1.073	7	2	6	8	1	2	3	2	2.0
B 8798-20	122 g-l	1.065	6	2	6	9	-	-	-	-	-
PAB 8812-21	117 h-l	1.065	7	3	-	8	3	2	5	4	3.5

Virginia Table 2 (cont'd). Potato Seedlings and Varieties, 1980
Intermediate Trial, Round Whites.

Variety	Yield Cwt/A 1-7/8" +	Specific Gravity[6]	Maturity[4]	Shape[1]	Confor-mation[2]	Sprouts[3]	Chip Color[5] Wks. After Harvest 0	1	2	3	Avg
B 9285-2	104 i-1	1.079	5	1	6	9	-	-	-	-	-
B 8833-6	99 j-1	1.082	6	6	5	8	Russet				
B 9165-3	84 k-1	1.062	4	3	5	5	-	-	-	-	-
B 8529-4	78 1	1.079	4	4	8	9	1	3	3	3	2.5

1 2 3 4 5 6 - See footnotes Virginia Table 1.
*Duncan's Multi Range, 5%.

Virginia Table 3. Selected Clones, First-Year Observational Trial.

Variety	Yield Cwt/A 1-7/8" +	Specific Gravity[6]	Maturity[4]	Shape[1]	Confor-mation[2]	Sprouts[3]	
B9016-20	279	1.0754	6	2	7	9	
B9018-12	197	1.0743	5	2	7	9	
B9127-6	268	1.0654	6	2	7	9	
B9130-6	141	1.0778	5	1	7	9	
B9140-32	205	1.0777	6	2	7	9	
B9144-5	156	1.0733	7	3	7	9	
B9148-5	184	1.0789	6	2	7	9	
B9172-11	176	1.0719	4	3	7	9	Heat Nec.
B9175-7	194	1.0767	7	3	7	7	
B9282-12	186	1.0788	5	2	7	8	
B9332-2	140	1.0667	9	2	7	9	
B9335-3	205	1.0798	7	3	7	9	
B9335-7	170	1.0744	6	3	6	9	
B9335-15	147	1.0766	4	8	8	9	
B9335-20	126	1.0794	7	2	7	9	
B9335-35	171	1.0880	6	3	7	9	
B9335-60	215	1.0789	5	2	7	9	
B9337-7	192	1.0744	4	3	7	9	
B9340-13	180	1.0811	4	2	6	9	
B9341-6	290	1.0743	7	2	7	9	Heat Nec.
B9344-15	275	1.0856	6	2	7	9	
B9344-21	200	1.0847	6	2	7	9	
B9384-2	210	1.0732	6	2	7	8	
B9384-6	299	1.0756	6	1	7	9	
B9423-4	312	1.0665	5	2	6	9	
B9439-4	238	1.0765	4	2	7	9	
B9445-2	341	1.0755	6	2	7	9	
B9455-3	276	1.0756	4	1	8	9	
B9467-1	276	1.0810	4	2	7	9	
B9467-3	281	1.0834	6	1	7	9	Heat Nec.
B9467-4	316	1.0689	6	2	6	9	

Virginia Table 3 (cont'd). Selected Clones, First-Year Observational Trial.

Variety	Yield Cwt/A 1-7/8" +	Specific Gravity[6]	Maturity[4]	Shape[1]	Confor-mation[2]	Sprouts[3]	
B9473-4	193	1.0710	5	1	7	9	
B9473-7	243	1.0642	6	2	7	9	
B9473-9	214	1.0655	5	1	8	9	Heat Nec.
B9481-2	298	1.0778	4	2	7	9	
B9489-2	238	1.0867	7	2	7	9	
B9497-2	204	1.0767	4	2	7	9	
La Chipper	141	1.0688	4	3	6	8	
Atlantic	200	1.0870	6	2	7	9	
Atlantic	274	1.0868	7	2	7	9	
B6969-2	182	1.0743	4	1	7	9	
B6969-2	1681	-	3	2	7	9	

1 2 3 4 6 - See footnotes Virginia Table 1.

Virginia Table 4. Potato Varieties and Seedlings - Advanced Russet Trial.

Variety	Yield Cwt/A Size A	Ounces per Tuber	Specific Gravity[6]	Maturity[4]	Shape[1]	Conformation[2]	Sprouts[3]
B9147-3	163 a*	-	1.071	7	6	7	9
B8697-29	161 a	5.9	1.070	6	4	7	8
B8977-2	157 a	-	1.066	8	4	6	8
B8972-1	147 a	6.5	1.083	7	7	8	8
B7583-6	143 ab	4.0	1.082	7	4	6	9
Norgold Russet	115 bc	4.7	1.066	5	4	5	7
Centennial	112 bc	4.1	1.079	6	7	5	9
B9230-6	110 c	-	1.077	5	7	6	9
BelRus	105 c	5.9	1.084	8	6	5	8

1 2 3 4 6 - See footnotes Virginia Table 1.

* Duncan's Multi Range, 5%.

Virginia Table 5. Potato Varieties and Seedlings - Intermediate Russet Trial.

Variety	Yield Cwt/A Size A	Ounces per Tuber	Specific Gravity[6]	Maturity[4]	Shape[1]	Confor-mation[2]	Sprouts[3]	
B9137-9	191 a*	5.4	1.073	5	6	6	9	
B9219-2	181 ab	5.6	1.073	6	5	7	8	Bi-color
Norgold Rus. 10	170 abc	6.3	1.065	7	6	7	8	
Norgold Rus. L	170 abc	4.9	1.066	8	4	6	9	
Norgold Rus. 19	166 abc	5.2	1.063	8	6	6	9	
Norgold Rus. M	164 abc	5.1	1.065	7	4	6	9	
Norgold Rus. 35	162 abc	5.2	1.067	8	4	6	8	
Norgold Rus.	158 a-d	6.2	1.068	5	5	7	9	
B9200-3	153 a-d	5.1	1.069	5	3	6	9	
Norgold Rus. 1	153 a-d	4.8	1.073	9	6	6	9	White eyed
Norgold Rus. 7	152 a-d	5.3	1.065	8	5	6	8	
B9281-6	147 b-d	6.1	1.070	6	7	5	9	Bi-color
Centennial	133 cd	4.3	1.075	5	6	7	9	
B9295-2	128 cd	5.2	1.079	5	6	6	9	
B8934-4	119 d	4.7	1.076	7	3	6	8	

[1] [2] [3] [4] [6] - See footnotes Virginia Table 1.
*Duncan's Multi Range, 5%.

Virginia Table 6. Selected Clones - First Year Observational Trial.

Variety	Yield Size A Cwt/A	Specific Gravity[6]	Shape[1]	Confor-mation[2]	Sprouts[3]	Maturity[4]
B9164-1	137.5	1.0804	7	6	9	8
B9212-4	87.1	-	6	6	8	6
B9333-5	94.73	-	8	7	7	6
B9336-24	135.99	1.0700	7	7	9	5
B9398-2	194.82	1.0870	6	7	8	9
B9399-17	196.3	1.0753	6	7	9	8
B9399-27 LW*	186.41	1.0743	4	7	9	5
B9418-7	111.45	-	7	8	9	6
B9419-1	174.19	1.0777	7	7	7	9
B9419-6	187.18	1.0776	5	6	8	4
B9419-9	197.87	1.0588	7	7	8	5
B9434-18	117.65	1.0833	7	7	9	5
B9436-2	131.40	1.0781	7	8	8	6
B9406-2	221.56	1.0787	7	7	9	8
B9217-7	213.15	1.0709	5	7	9	6
Norgold Russet	145.92	1.0667	6	7	9	6

1 2 3 4 6 - See footnotes Virginia Table 1.
*LW = Long shape, white skin.

WEST VIRGINIA

R. J. Young, S. I. Pencis, R. E. Adams, and J. A. Hayes

Test for Resistance to Potato Race-O of Phytophthora infestans

Late Blight Trial 1980. A field test to evaluate resistance to potato race-O of Phytophthora infestans (Mont.) de Bary was conducted on the West Virginia University Agriculture and Forestry Experiment Station farm located at Reedsville, W. Va. The farm is located at an elevation of 1760 feet on deep Atkins loam soil. Seedlings and varieties from the various potato breeding programs associated with NE107 including Agriculture Canada and the IR-I project were machine-planted on May 8, 1980. Fertilizer and systemic insecticide were incorporated into the furrows at rates determined by soil test and manufacturers recommendations respectively. Clones were evaluated in either 5 or 8 hill non-replicated plots. Katahdin (Ro) was planted to the border rows providing susceptible foliage for the natural recycling of the pathogen. Katahdin leaves were inoculated with race-O P. infestans during the evening hours of July 19. The minimum temperature was about 15° C and a heavy dew had formed providing good to excellent conditions for inoculation and infection. Good infection was noted on inoculated plants by July 25. Disease development was slow to moderate due to slightly higher than normal temperatures for July and August. However, by August 21, susceptible clones such as Green Mountain and Katahdin were nearly 80% defoliated. Clones were evaluated on 7-30, 8-21, and 8-12, and scored for late blight infection and general plant condition (Table 1).

West Virginia Table . Foliar reaction to infection by Phytophthora infestans, Potato race-0. Reedsville, W. Va. 1980.

1980 Field No.	Pedigree	Foliar Reaction[1/] 7-30	8-21	9-12	Type[2/] of Resistance
Agri. Canada					
1681	Tarn A105	1/8+[1/]	1/6+	1/3	R
1685	Tarn A132	1/9	1/7	1/3	R
1689	Tarn A203	1/9	1/9	1/8	R
1683	Tarn A249	1/8+	1/7	1/3	R
1688	Tarn A276	1/8+	1/8+	1/7+	R
1687	Tarn A289	1/9	1/7	1/3+	R
1686	Tarn A421	1/8+	1/8	1/3+	R
1684	Tarn A453	1/9	1/8+	1/7	R
1682	Tarn A505	1/8+	1/8	1/5	R
1690	Tarn A541	1/8+	1/8+	1/7+	R
1476	Green Mtn.	1/8+	8+/3-	Dead	S
1475	Libertas	1/7+	5-6/5+	Dead	M-3
1479	F72090	1/4	Dead	-	NT
1480	F72127	1/7+	1/4	Dead	R
1483	F73008	1/9	1/9	1/7	R
1482	F73092	1/8	8/3+	Dead	S
1486	F73099	1/8	8/4	Dead	S
1488	F73104	1/8	2+-3-/7+	Dead	M-2
1487	F74047	1/8+	8+/2+	Dead	S
1478	F74099	1/7	8+/2+	Dead	S
1484	F74117	1/9	7/4	Dead	S
1468	F74123	1/7	1/5+	1/2	R
1481	F75040	1/8	8+/2	Dead	S
1485	F75077	1/8	7+/2+	Dead	S
1477	F75079	1/7	8+/3	Dead	S
1471	F75081	1/5	7-8/3-	Dead	S
1472	F75114	1/7+	5-6/6	Dead	M-3
1470	F76021	1/6	7-8/4-	Dead	S
1473	F76054	1/5	8-9/3-	Dead	S
1474	F76076	1/7+	10/1+	Dead	S
1469	F77002	1/7+	4-5/5+	Dead	M-3
IR-1 Material					
1405	Ackersegen	1/8w	1/5	1+-2/3	M-1
1404	Alpha	1/8w	1/6	1+-2/3+	M-1
1430	Atzimba	1/7	1/7	1/7	R
1415	Bertita	1/8	1/8	1/7+	R
1416	Dorita	1/8	1/6+	1/2+	R
1401	Elenita	1/6w	1/4	Dead	R
1414	Greta	1/9	1/8+	1/7+	R
1417	Hindenberg	1/8	1-2/7	4/6	M-2
1418	Izstades	1/9	1/8+	1/7+	R
1419	Kenya Akabi	1/9	1/8	1/7+	R

West Virginia Table . (Continued)

1980 Field No.	Pedigree	Foliar Reaction[1] 7-30	8/21	9-12	Type[2] of Resistance
1406	Kufri Jeevan	1/8w	1/5	1/2	R
1407	Kufri Joti	1/7w	1/5	1/2	R
1410	Libertas	1/9	1/8+	Dead	R
1428	Limosa	1/6	1/3+	Dead	R
1409	Loscikij	1/9	1/8	1/2	R
1403	Maritta	1/8+w	1/7	1/6	R
1422	Marries	1/8	2+/6+	1/2	M-1
1421	Acl-dms-Sto-thr (R2244)	1/8	1/5	1/2	R
1402	Adj-tbr (R2243)	1/6w	1/4	1+-2/5	M-1
1424	dms-tbr (R2245)	1/8	1/7+	1/6	R
1425	dms-tbr (R2248)	1/8	Trace/6	1/4	R
1411	Sto-tbr (R2241)	1/8	1/7	1/5	R
1423	USW930-1	1/8	1/6+	1/7+	R
1433	3618 (R2181)	1/8	1/7+	1/3	R
1427	203905 (R_2) (R2211)	1/8	Dead	-	NT
Maine					
1659	AF330-8	1/5w	Dead	-	NT
1655	AF332-9	1/6w	1/4	Dead	R
1658	AF332-11	1/4w	Dead	-	NT
1647	AF339-5	1/6w	1/6	Dead	R
1668	AF339-11	1/7+	10+/2-	Dead	S
1666	AF389-3	1/8	1/7+	1/3+	R
1660	AF424-5	1/6w	1/3+	Dead	R
1675	AF426-1	1/5	Dead	-	NT
1671	AF428-12	1/7+	1/5	Dead	R
1657	AF431-34	1/4w	1/4	Dead	R
1664	CF7416-3	1/6w	1/2	Dead	R
1667	CF7523-1	1/8	1/7	Dead	R
1677	CF7608-19	1/8	1/6	1/3+	R
1656	CF7615-4	1/3w	1/4	Dead	R
1674	CF7710-5	1/4	1/4	Dead	R
1652	CF7719-6	1/3w	Dead	-	NT
1651	CF7722-19	1/6w	Dead	-	NT
1649	CF7784-5	1/5w	Dead	-	NT
1665	CF7793-2	1/7+	1/7	Dead	R
1650	CF72107-15	1/5w	1/3	Dead	R
1646	CF72111-5	1/4w	Dead	-	NT
1662	CF77110-5	1/4w	1/3	Dead	R
1669	CF77127-3	1/7+	1/6	Dead	R
1676	CF77139-14	1/5	1/5	Dead	R
1653	CF77143-10	1/2w	Dead	-	NT
1648	CF77146-6	1/6w	Dead	-	NT
1645	CF77154-10	1/4w	Dead	-	NT
1661	CF77159-3	1/7w	1/4+	Dead	R
1663	CF77159-9	1/7W	Dead	-	NT
1673	CF77161-1	1/8	Dead	-	NT

West Virginia Table . (Continued)

1980 Field No.	Pedigree	Foliar Reaction[1] 7-30	8-21	9-12	Type[2] of Resistance
1670	CF77189-10	1/7+	1/5+	Dead	R
1654	CS7296-5	1/3w	Dead	-	NT
1672	WF530-3	1/8+	1/6+	Dead	R
New York					
1678	NY59	1/9	6+/5	8/3+	M-3
1679	NY61	1/9	1/8	1/3	R
1680	NY63	1/9	8+/3	Dead	S
NE107					
1436	Allagash Russet	1/7	6-7/5	Dead	M-3
1437	Atlantic	1/8+	1/8+	1/3	R
1453	Bake King	1/9	1/5	Dead	R
1439	Belchip	1/9	1/8+	1/6+	R
1438	Bel Rus	1/7	Dead	-	NT
1441	Buckskin	1/8+	1/8+	1/5	R
1442	Butte	1/9	10+/2-	Dead	S
1444	Centennial Russet	1/8	11-/1+	Dead	S
1448	Croatan	1/8+	7-8/4-	Dead	S
1450	Denali	1/9	10+/2-	Dead	S
1446	Jemseg	1/7-	Dead	-	NT
1452	Katahdin (Ro)	1/9	10/3-	Dead	S
1459	Kennebec (R_1)	1/8+	1/8+	1/2-	R
1457	Monona	1/4+	10+/1+	Dead	S
1434	Norchip	1/7+	10+/2-	Dead	S
1445	Pungo	1/8+	1/8+	1/2+	R
1443	Russet Burbank	1/8	10-/3-	Dead	S
1455	Sebago	1/8+	6/5+	10+/1+	M-3
1440	Shepody	1/8	1/8	1/4	R
1458	Shurchip	1/5	10+/1+	Dead	S
1460	Superior	1/4-	Dead	Dead	NT
1456	Tobique	1/8	1/7	1/2	R
1449	Wauseon	1/8+	1/4+	Dead	R
1463	AF92-3	1/4+	1/3	Dead	R
1454	AF186-2	1/7+	1/3+	Dead	R
1462	AF238-66	1/6	1/3	Dead	R
1461	AK24-3	1/9	1/8	1/3	R
1467	B7583-6	1/7+	1/5	Dead	R
1466	B7802-2	1/4	1/2	Dead	R
1447	C7358-26A	1/7	1/7	Dead	R
1464	CA02-7	1/8	9+/2+	Dead	S
1465	CD106-16	1/8+	1/5	Dead	R
1435	F67128	1/8	6-7/5	Dead	M-3
1451	F68036	1/9	7/4	Dead	M-4
USDA Material					
1536	B5141-6	1/8+	1/8	1/3	R
1537	B5389-4	1/7+	11-/1+	Dead	S
1547	B5422-10	1/9	1/7+	Dead	R

West Virginia Table . (Continued)

1980 Field No.	Pedigree	Foliar Reaction[1/] 7-30	8-21	9-12	Type[2/] of Resistance
1524	B6139-11	1/9	1/8+	1/5	R
1521	B7152-14	1/7+	1/3	Dead	R
1495	B7153-14	1/8+	1/7+	Dead	R
1510	BR6463-2	1/8	1/7+	1/6	R
1541	BR6558-16	1/6+	1/2+	Dead	R
West Virginia					
1540	Abnaki	1/8+	11-/1+	Dead	S
1500	Alamo (R_1)	1/8	1/6	Dead	R
1544	Boone	1/8+	1/8	1/3	R
1549	Calrose	1/9	(Trace)1+/7+	1/3	M-1
1543	Cascade	1/8+	9/2+	Dead	S
1526	Cherokee	1/8+	1/8	1/3	R
1494	Chippewa	1/9	10+/2-	Dead	S
1525	Fundy	1/8+	1/2	Dead	R
1512	Green Mtn.	1/8+	10+/2+	Dead	S
1550	Irish Cobbler	1/8+	10+/2	Dead	S
1507	Katahdin	1/8+	8+/3	Dead	S
1548	Kennebec	1/9	1/8+	1/5	R
1491	Merrimac	1/8	1/8	1/4	R
1502	Nampa	1/9	10+/2-	Dead	S
1506	Ona	1/8+	1/8	1/8	R
1496	Penn Chip (R_2)	1/8	1/6+	1/2	R
1493	Penobscot	1/8+	3-4/7+	Dead	M-2
1499	Pentland Ace (R_3)	1/8	1/7	1/2-	R
1489	Plymouth	1/8	1/6+	Dead	R
1532	Pontiac	1/9	8/6	Dead	S
1542	R. Burbank	1/8+	8+/4-	Dead	S
1565	Sebago (Ro)	1/9	6/6	10+/2	M-3
1528	Superior	1/8+	10+/1+	Dead	S
1497	Superior (Late)	1/8+	1/6	1/3+	R
1534	B3682-WV1	1/8+	1/4	Dead	R
1505	B3720-WV1	1/9	1/7	1/7+	R
1492	B5662-WV4	1/8+	1/8	1/5	R
1498	B5662-WV13	1/8	1/7+	1/4+	R
1531	B6026-WV5	1/8+	1/8+	1/8	R
1503	B6028-WV6	1/8+	1/8	1/7	R
1539	B6039-WV2	1/8+	1/7	1/4	R
1504	B6039-WV6	1/8+	1/8	1/7+	R
	B6039-WV9	1/8+	(Trace)1+/7+	1/2+	M-1
1538	B6043-WV6	1/9	1/8+	1/6	R
1511	B6086-WV21	1/8+	1/9	1/8+	R
1518	B6655-WV1	1/8+	1/8+	1/7+	R
1517	B6667-WV1	1/8+	4+/6+	Dead	M-2
1515	B6928-WV14	1/8+	2-3-/7+	7+/4	M-2
1530	B6935-WV2	1/8+	1/8+	1/6+	R
1490	B6949-WV3	1/8+	9+/3	Dead	S

West Virginia Table . (Continued)

1980 Field No.	Pedigree	Foliar Reaction[1/] 7-30	8-21	9-12	Type[2/] of Resistance
1522	B6949-WV7	1/7+	1/2	Dead	R
1545	B6960-WV2	1/9	1/7+	1/3	R
1520	B6975-WV1	1/8+	1/8+	2/8	R
1508	B6988-WV10	1/8+	1/8+	1/8	R
1509	B6992A-WV6	1/8	1/8+	1/8	R
1533	B6994-WV2	1/8+	1/7	1/4	R
1516	B7019-WV1	1/8+	Dead	-	NT
1501	BR5991-WV16	1/9	1/8+	1/8+	R
1527	BR5991-WV21	1/8+	1/8+	1/8	R
1546	L521-5	1/9	9/3	Dead	S
1551	M297-3	1/9	1/7-	1/2	R
1523	NY59	1/9	4+-5/7+	8/5	M-3
1569	3Rc-8	1/8+	1/7+	1/5	R
1570	1563_c-14	1/8	1/8	1/2+	R
1539	1563_c-14	1/8	1/6	3+/4	R

1/ (1/8+) - The first of the two numbers is the late blight rating, and is based on the Horsfall-Dimond rating system of 1-11; 1 = no late blight infection, 11 = 100% infection. The second of the two numbers (after the slash-/) is an indication of the general plant condition, and is based on a scale of 1-9: 1 = dead or nearly dead, while 9 = excellent health and vigor. The small "w" following the late blight/pl. cond. value indicates very wet conditions at least twice during the test period. On Aug. 18, 3.5" of ppt. fell in a 24-hour period leaving parts of the test plot standing in water for about 36 hours.

Planted: 5-8-80
Inoculated: 7-19-80. *Phytophthora infestans* Race-0.

2/ Type of resistance expressed:
S = Susceptible
M-1 = Multigenic, high
M-2 = Multigenic, medium-high
M-3 = Multigenic, medium
M-4 = Multigenic, medium-low
R = R-gene resistance
NT = No Test, plants died from unknown causes.

WISCONSIN

L. E. Towill and R. E. Hanneman, Jr.

Genetics, Cytogenetics and Physiology of the Tuber-bearing Solanum Species

(Cooperative USDA, SEA, AR and Wisconsin Experiment Station)

Discovery of 1EBN Diploid Solanum Species. A logical extension of the Endosperm Balance Number (EBN) proposal is that effective ploidy barriers could exist between diploid species. Crosses between 2x Solanum cardiophyllum and 2x(2EBN) S. verrucosum or the colchicine doubled, 4x form of the Mexican diploid S. cardiophyllum resulted in abortive seed. Only the 4x form of S. cardiophyllum could be crossed successfully with 2x(2EBN) S. verrucosum. The offspring of the 2x S. verrucosum x 4x S. cardiophyllum cross were morphologically hybrid and root-tip counts on all nine individuals were triploid. Therefore, 2x S. cardiophyllum must be 1EBN. This is further confirmed by the results of the cross between the standard 2x(2EBN) S. chacoense and an accession of 2x S. cardiophyllum (PI. 275215) which produces large amounts of 2n pollen. Chromosome counts were made on five of the 40 offspring and all were triploid.

The assignment of 1EBN has been made to two other diploid Solanums. S. fernandezianum is a non-tuber-bearing diploid of Series Etuberosa. Attempts to cross it with tuber-bearing South American diploids outside the Series Etuberosa have not been successful. However, though only one pollination was done, S. fernandezianum crossed with 2x(1EBN) S. cardiophyllum. The seeds produced were generally less plump and contained smaller embryos than in the parental intraspecific crosses. Only 20% of the seeds germinated. Six out of eight plants grown to maturity were obvious hybrids. Most notable was the formation of stolons, which is unknown in S. fernandezianum, though tubers were not formed even under short days. These six plants were almost completely male-sterile due to lack of normal pairing in meiosis. Though seeds from the S. fernandezianum x S. cardiophyllum cross were generally poor, 2x S. fernandezianum has been assigned 1EBN considering that crosses between 2x S. fernandezianum and 2x(2EBN) species (S. chacoense and Gp. Phureja) gave very poor, ungerminable, usually embryoless seeds.

Diploid S. commersonii is in the same Series as the species used as the 2EBN standard, 2x(2EBN) S. chacoense. Yet, the cross between these two diploids yielded only abortive seeds, as did the cross of 2x S. commersonii x 4x(2EBN) S. cardiophyllum. However, the cross 2x S. commersonii x 2x(1EBN) S. cardiophyllum was successful and, unlike the 2x S. fernandezianum x 2x S. cardiophyllum cross, the seeds were as plump and germinable as in the parental intraspecific crosses. Therefore, 2x S. commersonii has been assigned 1EBN.

There are no confirmed hybrids between a Series Etuberosa species and a South American diploid, though there has been considerable interest in using the Etuberosa germplasm. If the Etuberosa diploids are 1EBN, then it should be possible to cross their colchicine-doubled forms with 2x(2EBN) South American species. To test this proposal, colchicine-doubled 4x S. brevidens was produced and crossed with 2x(2EBN) S. chacoense. Though the seeds were rather poor, they did contain visible embryos and were much better developed than in

the 2x S. brevidens x 2x S. chacoense cross. Without special treatment one seed gave rise to a hybrid plant that was triploid, apparently the first such hybrid reported.

The data presented support the idea that there is an effective as well as numerical ploidy series in Solanum, with respect to endosperm function. It is the effective ploidies (EBN's) that must be in a 2:1 ratio in the endosperm for this tissue to develop normally. Using this concept it has been possible to break down crossing barriers between tuber-bearing and non-tuber-bearing species and between tuber-bearing species heretofore difficult to cross. Its extension should continue to overcome other "difficult" or "impossible" interspecific crosses. It should be pointed out, however, that the 2:1 EBN ratio is a necessary but not sufficient condition for a cross to succeed. A cross could fail becuase of the inability of the pollen tubes to effect fertilization or because of other unknown causes of a lack or failure of endosperm development.

Identification of an Asynaptic Mutant from Solanum commersonii. A completely asynaptic mutant has been found in a diploid (2n=2x=24) accession of S. commersonii (PI 243503). This mutant was first noted while chromosome counts were being made on buds of potentially colchicine doubled seedlings of this accession. One of these seedlings, expressed asynaptic behavior in meiosis. Because of this, additional seed of the original P.I. was planted, and the seedlings were screened for asynaptic behavior through meiotic studies on anther squashes of the developing buds of each seedling. Two asynaptic mutant diploids were discovered having all univalents in microsporogenesis.

Frequency of 2n Pollen in the Cultivated Potato. Haploids of Group Andigena (28 plant introductions) and of Gp. Tuberosum (31 cultivars), and plants of Gp. Phureja (F. Haynes and IR-1) and Gp. Stenotomum (IR-1) were screened cytologically for the frequency and occurrence of 2n pollen in conjunction with investigations on genetic diversity and heterosis in the cultivated potato. Individual pollen samples from each plant were stained with aceto-carmine and scored for 2n pollen based on pollen diameter.

Of the 118 Gp. Tuberosum haploids screened, 44 percent had 2n pollen with 19 percent having more than five percent 2n pollen. Sixty-two percent of the 76 Gp. Andigena haploids had some 2n pollen, with 26 percent having more than five percent 2n pollen. In Gp. Phureja, 177 plants were screened for 2n pollen with 29 percent having some 2n pollen, but only two percent had more than five percent 2n pollen. Gp. Stenotomum was a little better with 31 percent of the 74 plants screened having 2n pollen, but only eight percent had more than five percent 2n pollen.

If 2n pollen were involved in the evolution of the tetraploid cultivated potatoes, one would expect to find a higher gene frequency of the genes for 2n pollen in the tetraploids than in their diploid progenitor species. If the cultivated tetraploids arose by somatic doubling the expected gene frequency for 2n pollen genes would be the same at both ploidies. Rough estimates of the gene frequencies in these populations are 0.62 for Gp. Tuberosum haploids, 0.78 for Gp. Andigena haploids, 0.15 for Gp. Phureja and 0.37 for Gp. Stenotomum.

From this data we can conclude that sufficient 2n pollen clones exist in this material, particularly among Gps. Tuberosum and Andigena haploids, to make further breeding and genetic studies possible. Furthermore, the high frequency of 2n pollen genes in the cultivated tetraploids favorably supports the concept that 2n pollen was essential to their evolution.

Low Temperature Germplasm Preservation. Experiments with cryogenic storage of shoot tips and pollen have continued. Methodology developed for the successful cryopreservation of Solanum etuberosum shoot tips was applied to species and cultivars with varying success. In general, the method gave better survival of shoot tips from species, both in percent forming callus and shoots, than in cultivar materials. Results with cultivars are variable, callus was often observed, but few shoots developed. Several modifications of the basic method were examined, but no modification has given consistently high survival. Post-thaw conditions, including growth media supplements, are being examined. Microscopy of fixed sections taken from buds of S. etuberosum cooled to -196° C suggested that only a few cells survived the cooling/warming regime, but that these cells can develop the normal plantlet mass on the culture medium.

Experiments with pollen centered on the demonstration that liquid nitrogen-stored pollen, previously shown to exhibit a high percent germination in vitro, also caused seed set comparable to unfrozen pollen. This was observed for pollen from both species and cultivars. Experiments with vacuum-drying and survival were initiated.

Concern over abnormal regenerants from cell culture studies prompted field examination of meristem regenerants to ascertain that meristem culture does indeed produce normal plants. Hardened in vitro grown cuttings from cv. Russet Burbank and cv. Superior meristems were planted directly in the field and evaluated. All plants appeared normal over the growing season. Yield was smaller than that from tuber-grown cuttings for each cultivars, however this was probably due to the generally small size of the meristem-derived transplant and the lag in becoming established after transplanting.

Refrigeration and other minimal maintenance storage procedures designed for in vitro disease-free lines were continued. Ancymidol (a commercial gibberellin inhibitor) retarded shoot elongation in culture, prolonging time necessary between subcultures. At room temperature under a 16 hour culture photoperiod, cultivars, but not species, produced 1-3 tubers during dessication of the agar medium; with this protocol transfers using the tubers were only necessary at about 9-12 month intervals.

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